Trawl Survey of Juvenile Flatfish in Hecate Strait by the M/V *Double Decker*, April 10-27, 1984

J. Fargo, R. P. Foucher, J. Cooper
and S. C. Shields

Department of Fisheries and Oceans
Fisheries Research Branch
Pacific Biological Station
Nanaimo, British Columbia V9R 5K6

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Department of Fisheries and Oceans

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ABSTRACT

Fargo, J., R. P. Foucher, J. Cooper, and S. C. Shields. 1984. Trawl survey of juvenile flatfish in Hecate Strait by the M/V DOUBLE DECKER, April 10-27, 1984. Can. Data Rep. Fish. Aquat. Sci. 486: 51 p.

Since 1980, the Pacific Biological Station has conducted an annual trawl survey of Hecate Strait to assess the relative abundance of one- and two-year-old rock sole and English sole. This report summarizes results of the 1984 survey including sampling stations, catch rates of target species, biological data and oceanographic (XBT) temperature profiles.

Catch rates for 1-year-old English sole were substantially higher than in previous years. Ocean temperatures were above long-term averages.

Key words: trawl survey, abundance, juveniles, rock sole, English sole, temperature profiles

RÉSUMÉ

Fargo, J., R. P. Foucher, J. Cooper, and S. C. Shields. 1984. Trawl survey of juvenile flatfish in Hecate Strait by the M/V DOUBLE DECKER, April 10-27, 1984. Can. Data Rep. Fish. Aquat. Sci. 486: 51 p.

Depuis 1980, la Station de biologie du Pacifique effectue chaque année un levé par chalutage dans le détroit d'Hécate pour déterminer l'abondance relative de soles du Pacifique et de plies grand-père d'un et de deux ans. Le présent rapport résume les résultats du levé de 1984 en donnant les stations d'échantillonnage, le taux de capture des espèces visées, les données biologiques et les profils de température dans les océans (XBT).

Les taux de capture des plies grand-père ont été beaucoup plus élevés qu'au cours des années antérieures. Les températures de la mer ont été supérieures aux moyennes à long terme.

Mots-clés: levé par chalutage, abondance, juvéniles, sole du Pacifique, plie grand-père, profils de température

INTRODUCTION

Since 1980, annual trawl surveys for juvenile flatfish have been conducted in Hecate Strait (Stocker et al. 1981; Fargo, Hoyt et al. 1982; Fargo, Harling et al. 1982; and Fargo, Cooper et al. 1983).

The purpose of the survey is to provide annual indices of abundance for one and two year old rock and English soles. Hopefully, time series of juvenile abundance indices can be correlated with annual recruitment indices from cohort analysis results. The resulting model can then be used to predict the customarily variable recruitment of these species to important commercial fisheries in Hecate Strait.

This report provides the data collected and summarized results of the 1984 trawl survey conducted during April 10-27.

MATERIALS AND METHODS

The vessel chartered for the survey was the M/V DOUBLE DECKER, a 20-m (65-ft) fiberglass stern trawl. This vessel was also used for the 1983 survey.

Trawling gear was the same as for the 1983 survey (Fig. 3). A Gulf semi-balloon shrimp trawl with a 21.3 m (70 ft) headline was used. The sweep lines to the doors were 36.5 m (20 fath) long. The 2.7 x 1.4 m (9 x 4.5 ft) rectangular wooden doors used belonged to the vessel.

Haul durations were kept short (30 min) so that the entire catch could be weighed and processed. Cod-end lifts were weighed by means of an electronic load cell. Catches <1300 kg were dumped directly onto the sorting table and the entire catch was sorted and weighed. Catches $\geq$1300 kg were sorted on deck and representative subsamples were taken for measurements following procedures outlined in Westrheim (1967). A specially designed sorting table (Fargo, Cooper et al. 1983) facilitated sorting of catches and decreased processing time.

All specimens were measured fork length to the nearest centimeter. To expedite collection of ageing structures (otoliths and interopercular bones), heads were collected from small English sole and rock sole ($\leq$30 cm) for later processing ashore. The head samples were packed in plastic bags, labelled (species, sex, haul number, and date) and stored in a chest freezer aboard the vessel. A head length/fork length relationship was derived for both species on the 1982 survey (Fargo, Harling et al. 1982).

RESULTS

A total of 31 hauls were completed during the survey (Fig. 1). This was about half the average number made on previous surveys. The reason for this was severe weather throughout the course of the charter period. Bridge log information and catch data are contained in Appendix table 1. A list of scientific and common names of species caught is contained in Appendix table 2. Principal fish species caught during the survey included:

Species	Weight (kg)	% of total catch
Skate	1983	18.6
Rock sole	1607	15.0
English sole	1296	12.1
Butter sole	577	5.4
Rex sole	471	4.4
Dover sole	439	4.1
Spiny dogfish	439	4.1
Pacific halibut[a]	350	3.3
Pacific sanddab	341	3.2
Pacific cod	185	1.7
Arrowtooth flounder	175	1.6
Sand sole	145	1.4
Ratfish	126	1.2
Others[b]	2545	23.9
Total	10679	100.0

[a]Halibut caught were measured for fork length and released.

[b]Individual totals for other species were $\leq$1% of the total catch.

SIZE COMPOSITION

A list of biological samples collected during the cruise is contained in Table 1. Fork length measurements were collected from 6268 specimens, comprising 7 species.

Rock sole length measurements totalled 2869, of which 2825 were sexed. Total size composition is shown in Figure 4 and by haul in Appendix table 3. Heads for ageing were taken from 39 rock sole.

English sole length measurements totalled 2683, of which 2370 were sexed. Total size composition is shown in Figure 4, and by haul in Appendix table 4. Heads for ageing were taken from 312 English sole.

Length frequency data collected for other species listed in Table 1 are compiled by haul in Appendix tables 5-9.

CATCH RATES

Mean catch rates for 10-fath depth intervals over the depth range 10-59 fath are listed in Table 2. For juvenile English sole (<30 cm), catch rates peaked at 50-59 fath (4568/h). For juvenile rock sole (<30 cm), catch rates peaked at 40-49 fath (553/h). Catch rates for 1-year-old English sole (1983 year-class) were ~10 times higher than for 1 year-olds in 1983.

WATER TEMPERATURES

Four XBT casts were completed -- two in Queen Charlotte Sound and two in Hecate Strait (Fig. 2; Appendix table 11). In general the warm temperature trend of 1983 was continued.

In 1983, ocean surface temperatures were 8.4-10.7°C. In 1984 ocean surface temperatures were 8.5 and 9.4°C in Hecate Strait and 7.5 and 9.3°C in Queen Charlotte Sound. The thermocline in both areas was around 100 meters.

ACKNOWLEDGMENTS

We wish to extend our appreciation to Captain Winston Decker and crewmen Earl Scott and Howard Decker. Their cooperation and good humour aboard this vessel was appreciated.

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Table 1. Inventory of biological data M/V DOUBLE DECKER, April 10-27, 1984.

	App. Table[a]	Length	Length/ sex	Length/ sex/age	Total
Rock sole	3	5	2825	39	2869
English sole	4	1	2370	312	2683
Butter sole	5	-	301	-	301
Dover sole	6	-	266	-	266
Pacific cod	7	92	-	-	92
Sandlance	8	43	-	-	43
Sand sole	9	-	14	-	14
Total		141	5776	351	6268

[a]Source of length-frequencies by haul.

Table 2. Target species catch rates by 10-fath (18-m) depth interval.

Depth interval (fath)	Species	Mean catch rate (kg/h)	No. of hauls	Mean catch rate (no/h)[a]	No. of hauls
10-19	English sole	7.9	11	86.2	11
	rock sole	116.3	11	50.8	11
20-29	English sole	50.7	12	1122.0	12
	rock sole	183.6	12	80.3	12
30-39	English sole	186.3	5	1971.0	5
	rock sole	130.6	5	270.2	5
40-49	English sole	202.1	2	999.6	2
	rock sole	63.4	2	553.3	-
50-59	English sole	1554.3	1	4567.7	1
	rock sole	-	-	-	-

[a]No. $\leq$ 30 cm.

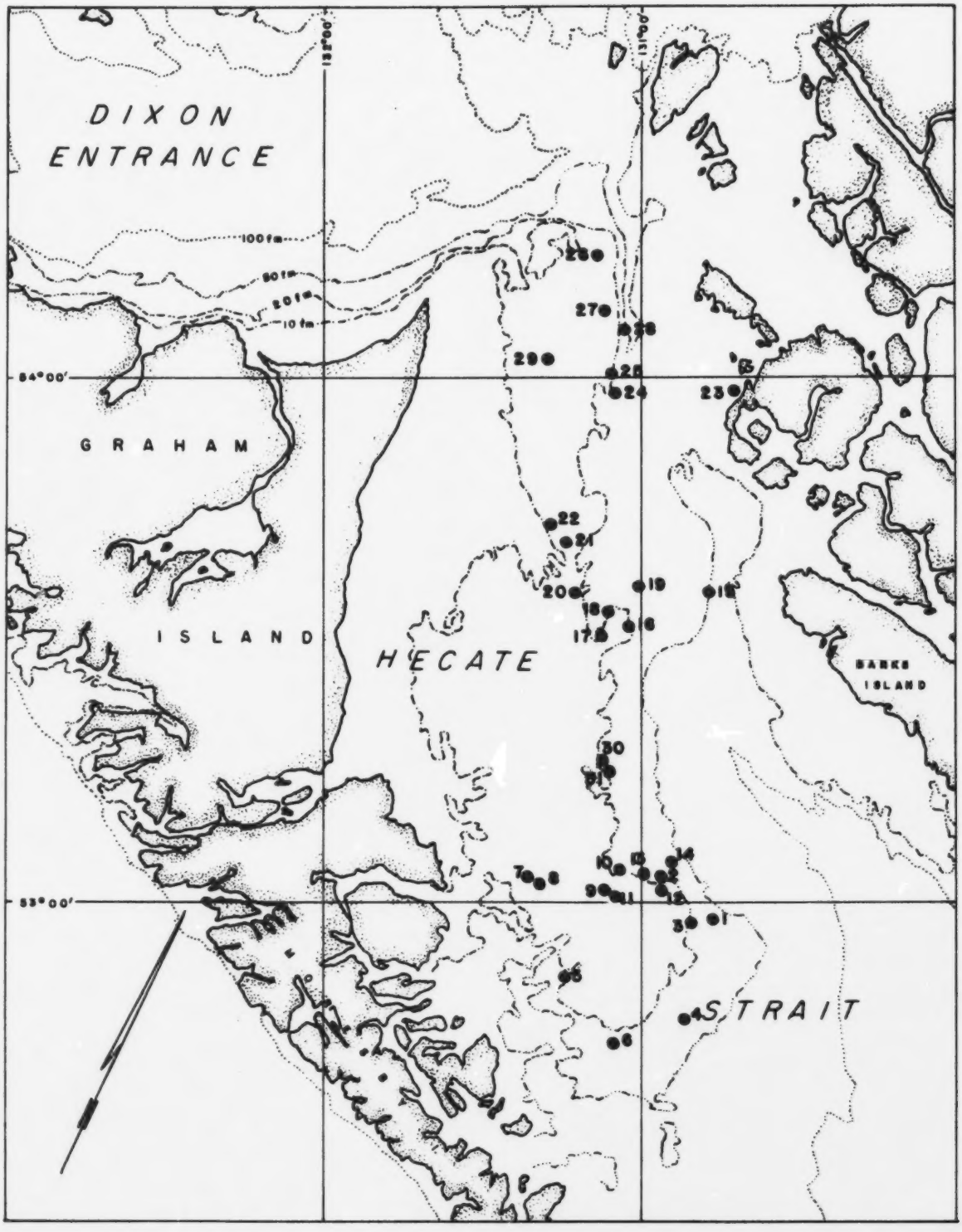


Fig. 1. Haul locations for M/V Double Decker juvenile survey, April 10-27, 1984.

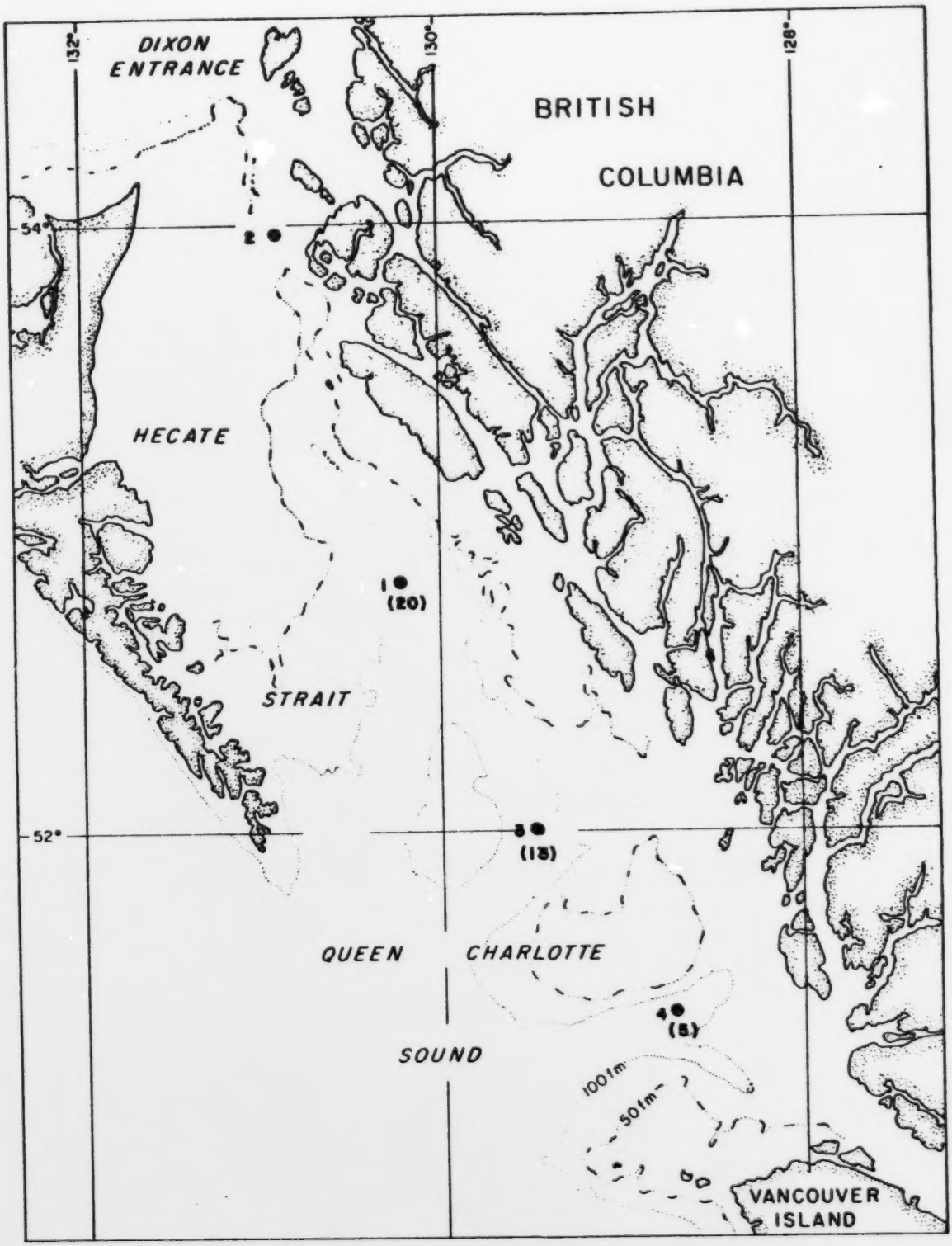
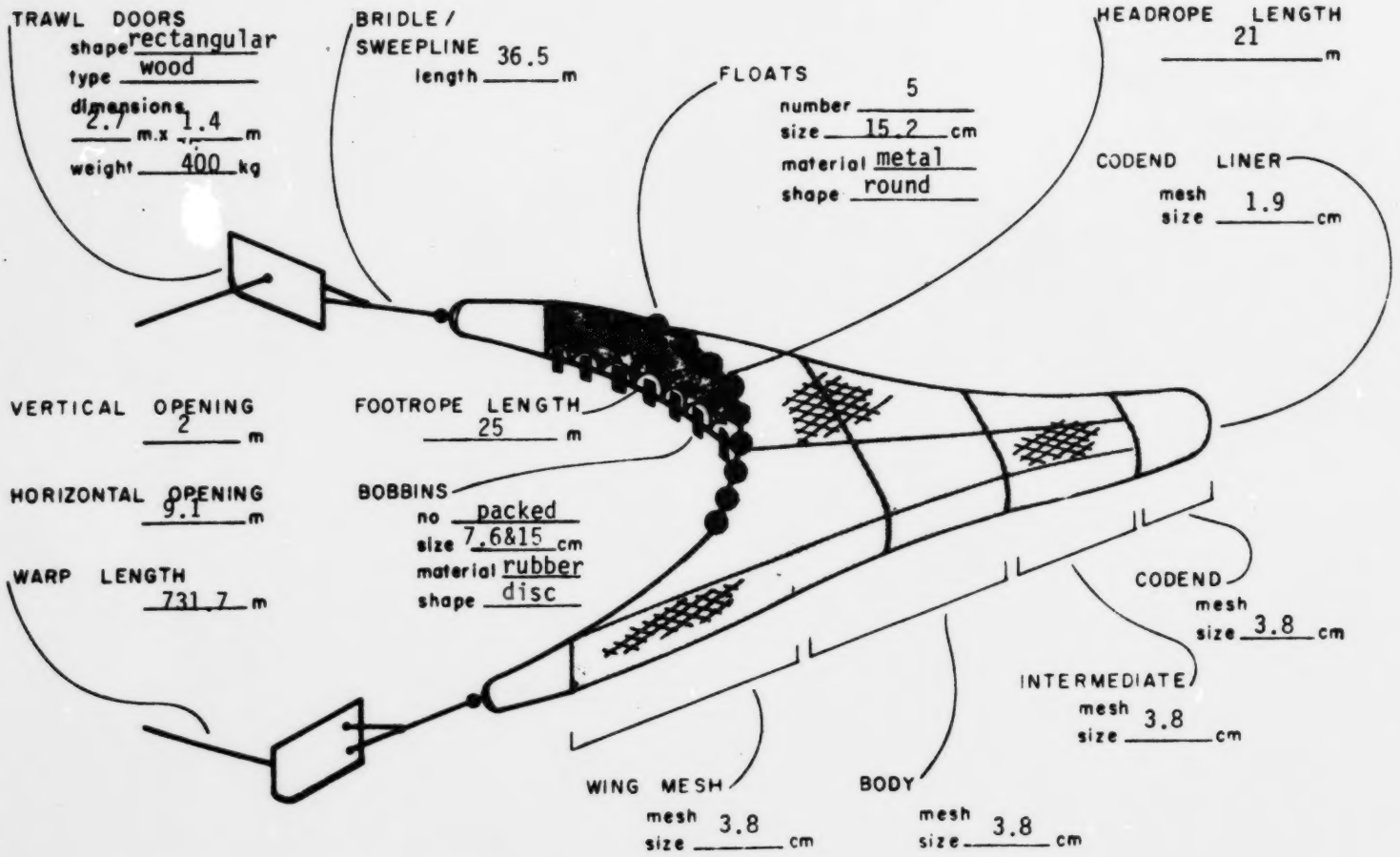


Fig. 2. Oceanographic (XBT) stations occupied by M/V Double Decker, April 10-27, 1984.

Fig. 3. NET DIMENSIONS AND CHARACTERISTICS FOR BOTTOM TRAWL

VESSEL M/V Double Decker NET 70 ft. Gulf Semi-balloon shrimp trawl

OBSERVATION PERIOD April 10-27, 1984



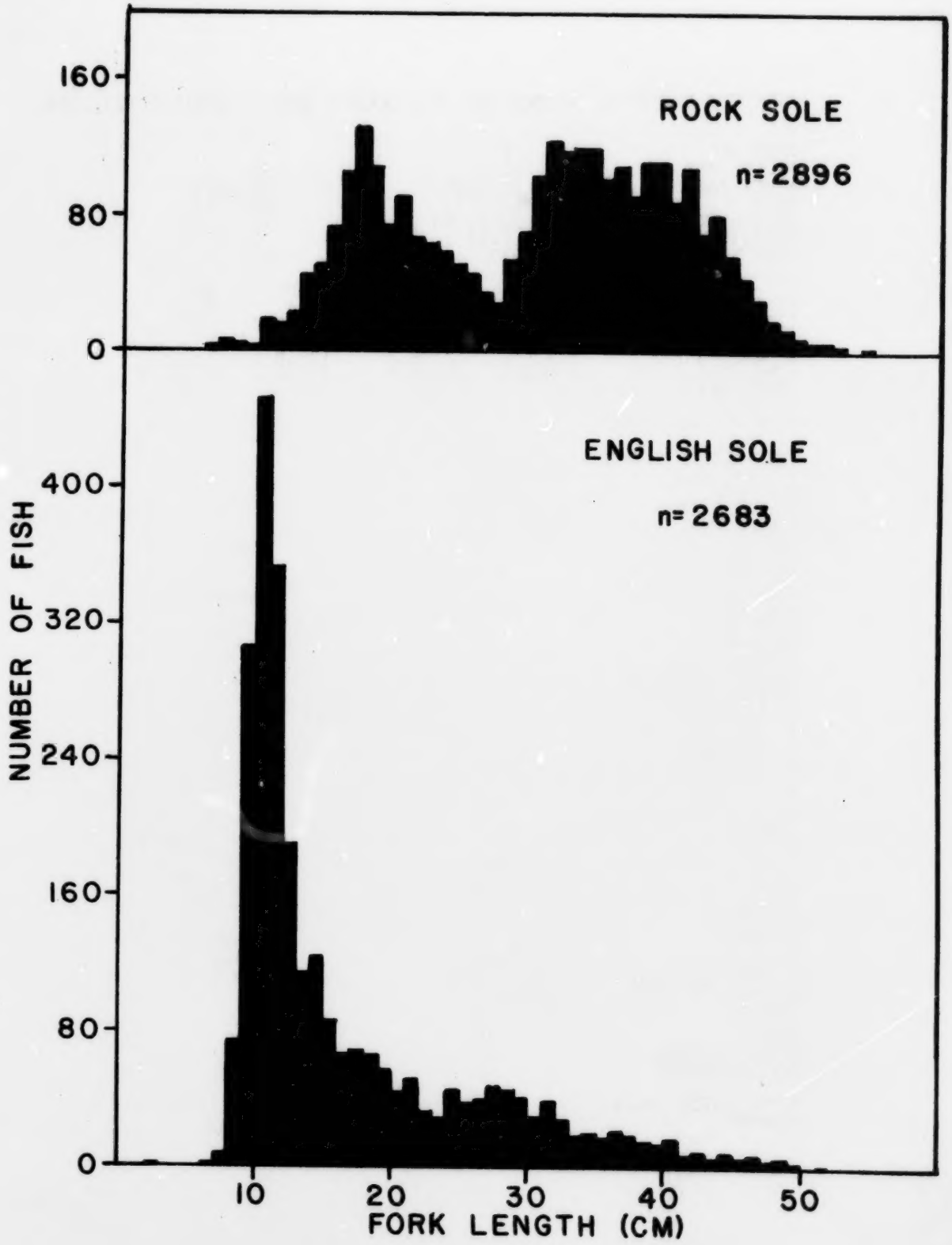


Fig. 4. Total size composition for rock sole and English Sole, M/V Double Decker, April 10-27, 1984.

APPENDIX TABLE 1. BRIDGE LOG M/V DOUBLE DECKER APRIL 10-27,1984.

HAUL NO.	1	2
MAJOR AREA	5C	5C
MINOR AREA	2B EAST	2B EAST
DATE	APR 12	APR 13
DEPTH MODE F/(M)	33 /(60)	18 /(32)
DURATION (H)	0.42	0.47
DIRECTION (DEG. TRUE)	270	210

	START	STOP	START	STOP
TIME	19:07	19:32	7:44	8:12
LAT.(DEG,MIN)	52 58	52 57.6	53 02.7	53 01.8
LONG.(DEG,MIN)	130 46.6	130 46.5	130 56.7	130 57.5
LC-5990-X	12321	12328.2	12248.4	12250
LC-5990-Z	41499.3	41498.5	41504.6	41501.8
DEPTH (F)	35	32	18	18

SPECIES CATCH(KG.)

ARROWTOOTH FLOUNDER	TRACE	-
BUTTER SOLE	3	-
C-O SOLE	-	-
CURLFIN SOLE	4	3
DOVER SOLE	-	-
ENGLISH SOLE	2	TRACE
FLATHEAD SOLE	-	-
PACIFIC HALIBUT	5	-
PACIFIC SANDDAB	12	TRACE
REX SOLE	-	-
ROCK SOLE	32	20
SAND SOLE	-	-
SLENDER SOLE	-	-
STARRY FLOUNDER	-	-
YELLOWFIN SOLE	-	-
S. FLAVIDUS	-	-
S. MALIGER	-	-
S. MELANOPS	-	-
S. PINNIGER	-	-
S. PRORIGER	-	-
GREENLINGS	-	-
PACIFIC HERRING	-	-
LINGCOD	-	-
PACIFIC COD	9	-
PACIFIC TOMCOD	TRACE	-
POACHERS	1	TRACE
RED IRISH LORD	-	-
SABLEFISH	-	-
SANDLANCE	-	TRACE
SCULPINS	-	TRACE
SHINER PERCH	6	TRACE
WALLEYE POLLOCK	-	-
WOLFEEL	-	-
RATFISH	5	-
SKATES	15	38
SPINY DOGFISH	-	3
INVERTEBRATES	-	TRACE
TOTAL CATCH (KG.)	94	64
REMARKS	USABLE	USABLE

APPENDIX TABLE 1. BRIDGE LOG M/V DOUBLE DECKER APRIL 10-27,1984.

HAUL NO.	3	4
MAJOR AREA	5C	5C
MINOR AREA	2B EAST	2B EAST
DATE	APR 13	APR 13
DEPTH MODE F/(M)	25 /(45)	34 /(62)
DURATION (H)	0.47	0.33
DIRECTION (DEG. TRUE)	145	0

	START	STOP	START	STOP
TIME	9:30	9:58	12:05	12:25
LAT.(DEG,MIN)	52 57.7	52 57	52 47.2	52 47.7
LONG.(DEG,MIN)	130 51.6	130 50.3	130 52	130 51.9
LC-5990-X	12313.6	12317.2	12374.3	12373.9
LC-5990-Z	41494.4	41492.4	41454.4	41456.3
DEPTH (F)	26	24	34	33

SPECIES CATCH(KG.)

ARROWTOOTH FLOUNDER	-	-
BUTTER SOLE	-	-
C-O SOLE	-	-
CURLFIN SOLE	2	-
DOVER SOLE	-	-
ENGLISH SOLE	TRACE	-
FLATHEAD SOLE	-	-
PACIFIC HALIBUT	-	-
PACIFIC SANDDAB	TRACE	2
REX SOLE	-	-
ROCK SOLE	19	22
SAND SOLE	-	-
SLENDER SOLE	-	-
STARRY FLOUNDER	-	-
YELLOWFIN SOLE	-	-
S. FLAVIDUS	-	-
S. MALIGER	-	-
S. MELANOPS	-	-
S. PINNIGER	-	TRACE
S. PRORIGER	-	-
GREENLINGS	-	-
PACIFIC HERRING	-	-
LINGCOD	-	-
PACIFIC COD	-	-
PACIFIC TOMCOD	-	-
POACHERS	-	TRACE
RED IRISH LORD	-	-
SABLEFISH	-	-
SANDLANCE	-	-
SCULPINS	TRACE	-
SHINER PERCH	-	-
WALLEYE POLLOCK	-	-
WOLFEEL	-	-
RATFISH	5	TRACE
SKATES	15	-
SPINY DOGFISH	-	59
INVERTEBRATES	-	53
TOTAL CATCH (KG.)	41	136
REMARKS	USABLE	USABLE

APPENDIX TABLE 1. BRIDGE LOG M/V DOUBLE DECKER APRIL 10-27,1984.

HAUL NO.	5	6
MAJOR AREA	5C	5C
MINOR AREA	2B EAST	2B EAST
DATE	APR 15	APR 15
DEPTH MODE F/(M)	23 /(42)	38 /(69)
DURATION (H)	0.43	0.25
DIRECTION (DEG. TRUE)	355	315

	START	STOP	START	STOP
TIME	8:15	8:41	12:30	12:45
LAT.(DEG,MIN)	52 51.2	52 51.6	52 44.2	52 46.2
LONG.(DEG,MIN)	131 15.5	131 15	131 06.7	131 07
LC-5990-X	12258.1	12259	12388.4	12388.6
LC-5990-Z	41444.7	41447	41428	41429.7
DEPTH (F)	25	20	38	38

SPECIES CATCH(KG.)

ARROWTOOTH FLOUNDER	-	-
BUTTER SOLE	-	-
C-O SOLE	-	-
CURLFIN SOLE	6	-
DOVER SOLE	-	-
ENGLISH SOLE	-	-
FLATHEAD SOLE	-	-
PACIFIC HALIBUT	-	-
PACIFIC SANDDAB	-	-
REX SOLE	-	-
ROCK SOLE	291	100
SAND SOLE	6	-
SLENDER SOLE	-	-
STARRY FLOUNDER	-	-
YELLOWFIN SOLE	-	-
S. FLAVIDUS	-	-
S. MALIGER	-	-
S. MELANOPS	-	-
S. PINNIGER	-	-
S. PRORIGER	-	-
GREENLINGS	-	-
PACIFIC HERRING	-	-
LINGCOD	-	20
PACIFIC COD	-	-
PACIFIC TOMCOD	-	-
POACHERS	-	-
RED IRISH LORD	-	-
SABLEFISH	-	-
SANDLANCE	-	-
SCULPINS	-	-
SHINER PERCH	-	-
WALLEYE POLLOCK	-	-
WOLFEEL	-	-
RATFISH	5	10
SKATES	158	350
SPINY DOGFISH	20	10
INVERTEBRATES	45	75
TOTAL CATCH (KG.)	531	565
REMARKS	USABLE	USABLE

APPENDIX TABLE 1. BRIDGE LOG M/V DOUBLE DECKER APRIL 10-27,1984.

HAUL NO.	7		8	
MAJOR AREA	5C		5C	
MINOR AREA	2B EAST		2B EAST	
DATE	APR 16		APR 16	
DEPTH MODE F/(M)	16 // (29)		20 // (36)	
DURATION (H)	0.32		0.42	
DIRECTION (DEG. TRUE)	40		45	
	START	STOP	START	STOP
TIME	7:45	8:04	8:50	9:15
LAT.(DEG,MIN)	53 02.8	53 03.4	53 02.1	53 02.5
LONG.(DEG,MIN)	131 23.3	131 21	131 20.3	131 18.1
LC-5990-X	12146.6	12147.4	12161.3	12165.4
LC-5990-Z	41479.3	41481.6	41479.4	41481.2
DEPTH (F)	18	14	18	22
SPECIES CATCH(KG.)				
ARROWTOOTH FLOUNDER	-		-	
BUTTER SOLE	-		-	
C-O SOLE	-		-	
CURLFIN SOLE	2		5	
DOVER SOLE	-		-	
ENGLISH SOLE	TRACE		TRACE	
FLATHEAD SOLE	-		-	
PACIFIC HALIBUT	-		13	
PACIFIC SANDDAB	-		-	
REX SOLE	-		-	
ROCK SOLE	59		154	
SAND SOLE	10		38	
SLENDER SOLE	-		-	
STARRY FLOUNDER	-		-	
YELLOWFIN SOLE	-		-	
S. FLAVIDUS	-		-	
S. MALIGER	-		-	
S. MELANOPS	-		-	
S. PINNIGER	-		-	
S. PRORIGER	-		-	
GREENLINGS	-		-	
PACIFIC HERRING	-		-	
LINGCOD	-		-	
PACIFIC COD	-		-	
PACIFIC TOMCOD	-		-	
POACHERS	-		-	
RED IRISH LORD	2		-	
SABLEFISH	-		-	
SANDLANCE	-		-	
SCULPINS	-		-	
SHINER PERCH	-		-	
WALLEYE POLLOCK	-		-	
WOLFEEL	-		-	
RATFISH	TRACE		60	
SKATES	-		-	
SPINY DOGFISH	-		-	
INVERTEBRATES	281		120	
TOTAL CATCH (KG.)	354		390	
REMARKS	USABLE		USABLE	

APPENDIX TABLE 1. BRIDGE LOG M/V DOUBLE DECKER APRIL 10-27,1984.

HAUL NO.	9		10	
MAJOR AREA	5C		5C	
MINOR AREA	2B EAST		2B EAST	
DATE	APR 16		APR 16	
DEPTH MODE F/(M)	18 ((32)		21 ((38)	
DURATION (H)	0.38		0.50	
DIRECTION (DEG. TRUE)	350		0	
	START	STOP	START	STOP
TIME	10:30	10:53	11:30	12:00
LAT. (DEG,MIN)	53 01.3	53 01.7	53 03.6	53 02.6
LONG. (DEG,MIN)	131 08	131 06.8	131 04.8	131 04
LC-5990-X	12218.9	12213.5	12213.8	12220.7
LC-5990-Z	41488.4	41491.6	41500	41498.6
DEPTH (F)	18	18	20	21
SPECIES CATCH(KG.)				
ARROWTOOTH FLOUNDER	-		-	
BUTTER SOLE	-		-	
C-O SOLE	-		-	
CURLFIN SOLE	TRACE		3	
DOVER SOLE	-		-	
ENGLISH SOLE	-		TRACE	
FLATHEAD SOLE	-		-	
PACIFIC HALIBUT	-		7	
PACIFIC SANDDAB	TRACE		TRACE	
REX SOLE	-		-	
ROCK SOLE	90		8	
SAND SOLE	7		-	
SLENDER SOLE	-		-	
STARRY FLOUNDER	-		-	
YELLOWFIN SOLE	-		-	
S. FLAVIDUS	-		-	
S. MALIGER	-		-	
S. MELANOPS	-		-	
S. PINNIGER	-		-	
S. PRORIGER	-		-	
GREENLINGS	-		-	
PACIFIC HERRING	-		-	
LINGCOD	-		-	
PACIFIC COD	-		-	
PACIFIC TOMCOD	-		-	
POACHERS	-		-	
RED IRISH LORD	-		-	
SABLEFISH	-		-	
SANDLANCE	-		-	
SCULPINS	-		-	
SHINER PERCH	-		-	
WALLEYE POLLOCK	-		-	
WOLFEEL	-		-	
RATFISH	8		6	
SKATES	5		-	
SPINY DOGFISH	-		33	
INVERTEBRATES	58		25	
TOTAL CATCH (KG.)	168		82	
REMARKS	USABLE		USABLE	

APPENDIX TABLE 1. BRIDGE LOG M/V DOUBLE DECKER APRIL 10-27,1984.

HAUL NO.	11		12	
MAJOR AREA	5C		5C	
MINOR AREA	2B EAST		2B EAST	
DATE	APR 16		APR 16	
DEPTH MODE F/(M)	19 /(34)		18 /(32)	
DURATION (H)	0.40		0.42	
DIRECTION (DEG. TRUE)	55		130	
	START	STOP	START	STOP
TIME	12:46	13:10	14:06	14:31
LAT. (DEG,MIN)	53 00.5	53 00.4	53 01.2	53 00.8
LONG. (DEG,MIN)	131 06.4	131 05.5	130 56.4	130 56.5
LC-5990-X	12222.1	12228.3	12261.4	12269.3
LC-5990-Z	41488.2	41488.6	41500.1	41498.6
DEPTH (F)	18	19	18	18
SPECIES CATCH(KG.)				
ARROWTOOTH FLOUNDER	-		-	
BUTTER SOLE	-		-	
C-O SOLE	-		-	
CURLFIN SOLE	5		-	
DOVER SOLE	-		-	
ENGLISH SOLE	TRACE		TRACE	
FLATHEAD SOLE	-		-	
PACIFIC HALIBUT	-		-	
PACIFIC SANDDAB	TRACE		TRACE	
REX SOLE	-		-	
ROCK SOLE	46		41	
SAND SOLE	5		TRACE	
SLENDER SOLE	-		-	
STARRY FLOUNDER	-		-	
YELLOWFIN SOLE	-		-	
S. FLAVIDUS	-		-	
S. MALIGER	-		-	
S. MELANOPS	-		-	
S. PINNIGER	-		-	
S. PRORIGER	-		-	
GREENLINGS	-		-	
PACIFIC HERRING	-		-	
LINGCOD	-		-	
PACIFIC COD	-		-	
PACIFIC TOMCOD	-		-	
POACHERS	-		-	
RED IRISH LORD	TRACE		-	
SABLEFISH	-		-	
SANDLANCE	TRACE		-	
SCULPINS	-		-	
SHINER PERCH	-		TRACE	
WALLEYE POLLOCK	-		-	
WOLFEEL	-		-	
RATFISH	TRACE		3	
SKATES	80		23	
SPINY DOGFISH	-		249	
INVERTEBRATES	TRACE		6	
TOTAL CATCH (KG.)	136		322	
REMARKS	USABLE		USABLE	

APPENDIX TABLE 1. BRIDGE LOG M/V DOUBLE DECKER APRIL 10-27,1984.

HAUL NO.	13	14
MAJOR AREA	5C	5C
MINOR AREA	2B EAST	2B EAST
DATE	APR 16	APR 16
DEPTH MODE F/(M)	33 ((60)	39 ((71)
DURATION (H)	0.35	0.38
DIRECTION (DEG. TRUE)	70	230

	START	STOP	START	STOP
TIME	15:54	16:15	18:13	18:36
LAT.(DEG,MIN)	53 03.4	53 03.5	53 05	53 05.8
LONG.(DEG,MIN)	130 59.5	130 59.6	130 54.4	130 54.9
LC-5990-X	12344.8	12351.3	12241.8	12235
LC-5990-Z	41504.5	41505.7	41517.3	41518.6
DEPTH (F)	32	34	39	39

SPECIES CATCH(KG.)

ARROWTOOTH FLOUNDER	-	25
BUTTER SOLE	-	-
C-O SOLE	-	-
CURLFIN SOLE	-	-
DOVER SOLE	-	-
ENGLISH SOLE	TRACE	352
FLATHEAD SOLE	-	-
PACIFIC HALIBUT	12	15
PACIFIC SANDDAB	TRACE	232
REX SOLE	-	TRACE
ROCK SOLE	21	19
SAND SOLE	-	-
SLENDER SOLE	-	TRACE
STARRY FLOUNDER	-	-
YELLOWFIN SOLE	-	-
S. FLAVIDUS	-	-
S. MALIGER	-	-
S. MELANOPS	-	-
S. PINNIGER	-	-
S. PRORIGER	-	-
GREENLINGS	-	-
PACIFIC HERRING	-	TRACE
LINGCOD	-	-
PACIFIC COD	-	-
PACIFIC TOMCOD	-	-
POACHERS	-	TRACE
RED IRISH LORD	-	-
SABLEFISH	-	-
SANDLANCE	TRACE	-
SCULPINS	-	-
SHINER PERCH	-	TRACE
WALLEYE POLLOCK	-	-
WOLFEEL	-	-
RATFISH	TRACE	-
SKATES	184	10
SPINY DOGFISH	5	-
INVERTEBRATES	23	-
TOTAL CATCH (KG.)	245	653
REMARKS	USABLE	USABLE

APPENDIX TABLE 1. BRIDGE LOG M/V DOUBLE DECKER APRIL 10-27,1984.

HAUL NO.	15	16
MAJOR AREA	5D	5D
MINOR AREA	5 UPPER	5 UPPER
DATE	APR 18	APR 19
DEPTH MODE F/(M)	40 // 73)	23 // 42)
DURATION (H)	0.33	0.25
DIRECTION (DEG. TRUE)	180	310

	START	STOP	START	STOP
TIME	6:56	7:16	8:41	8:56
LAT. (DEG,MIN)	53 36.3	53 35.7	53 32	53 33
LONG. (DEG,MIN)	130 47.4	130 47.6	131 03	131 02.1
LC-5990-X	12039.6	12043.6	12010.1	12006.3
LC-5990-Z	41632.3	41628.9	41606.1	41605.8
DEPTH (F)	40	40	23	22

SPECIES CATCH (KG.)

ARROWTOOTH FLOUNDER	-	-
BUTTER SOLE	4	-
C-O SOLE	-	-
CURLFIN SOLE	4	-
DOVER SOLE	-	-
ENGLISH SOLE	22	TRACE
FLATHEAD SOLE	-	-
PACIFIC HALIBUT	-	-
PACIFIC SANDDAB	8	-
REX SOLE	-	-
ROCK SOLE	15	26
SAND SOLE	-	-
SLENDER SOLE	-	-
STARRY FLOUNDER	-	-
YELLOWFIN SOLE	-	-
S. FLAVIDUS	-	-
S. MALIGER	-	-
S. MELANOPS	-	-
S. PINNIGER	-	-
S. PRORIGER	-	-
GREENLINGS	-	1
PACIFIC HERRING	-	-
LINGCOD	-	TRACE
PACIFIC COD	-	-
PACIFIC TOMCOD	-	-
POACHERS	-	-
RED IRISH LORD	-	-
SABLEFISH	-	-
SANDLANCE	-	-
SCULPINS	-	-
SHINER PERCH	-	-
WALLEYE POLLOCK	-	-
WOLFEEL	-	-
RATFISH	-	1
SKATES	67	-
SPINY DOGFISH	-	3
INVERTEBRATES	2	55
TOTAL CATCH (KG.)	122	86
REMARKS	USABLE	USABLE

APPENDIX TABLE 1. BRIDGE LOG M/V DOUBLE DECKER APRIL 10-27,1984.

HAUL NO.	17	18
MAJOR AREA	5D	5D
MINOR AREA	5 UPPER	5 UPPER
DATE	APR 19	APR 19
DEPTH MODE F/(M)	18 /(32)	25 /(45)
DURATION (H)	0.37	0.43
DIRECTION (DEG. TRUE)	0	70

	START	STOP	START	STOP
TIME	10:03	10:25	11:10	11:36
LAT.(DEG,MIN)	53 30.6	53 29.9	53 33.4	53 34.2
LONG.(DEG,MIN)	131 08.6	131 10.9	131 07	131 06.8
LC-5990-X	11999.5	11993.9	11985.1	11976.7
LC-5990-Z	41584.4	41586.7	41600.7	41603.9
DEPTH (F)	18	18	24	25

SPECIES CATCH(KG.)

ARROWTOOTH FLOUNDER	-	-
BUTTER SOLE	-	-
C-O SOLE	-	-
CURLFIN SOLE	2	2
DOVER SOLE	-	-
ENGLISH SOLE	-	-
FLATHEAD SOLE	-	-
PACIFIC HALIBUT	-	-
PACIFIC SANDDAB	-	-
REX SOLE	-	-
ROCK SOLE	32	152
SAND SOLE	4	TRACE
SLENDER SOLE	-	-
STARRY FLOUNDER	-	-
YELLOWFIN SOLE	-	-
S. FLAVIDUS	-	-
S. MALIGER	-	-
S. MELANOPS	-	-
S. PINNIGER	-	-
S. PRORIGER	-	-
GREENLINGS	-	-
PACIFIC HERRING	-	-
LINGCOD	-	-
PACIFIC COD	-	-
PACIFIC TOMCOD	-	-
POACHERS	-	-
RED IRISH LORD	-	-
SABLEFISH	-	-
SANDLANCE	-	TRACE
SCULPINS	-	-
SHINER PERCH	-	-
WALLEYE POLLOCK	-	-
WOLFEEL	-	-
RATFISH	-	-
SKATES	62	79
SPINY DOGFISH	-	-
INVERTEBRATES	TRACE	62
TOTAL CATCH (KG.)	100	295
REMARKS	USABLE	USABLE

APPENDIX TABLE 1. BRIDGE LOG M/V DOUBLE DECKER APRIL 10-27,1984.

HAUL NO.	19		20	
MAJOR AREA	5D		5D	
MINOR AREA	5 UPPER		2A EAST	
DATE	APR 19		APR 19	
DEPTH MODE F/(M)	26 ((47)		14 ((25)	
DURATION (H)	0.32		0.38	
DIRECTION (DEG. TRUE)	200		360	
	START	STOP	START	STOP
TIME	12:36	12:55	14:13	14:36
LAT.(DEG,MIN)	53 37.1	53 37.3	53 36	53 36.6
LONG.(DEG,MIN)	131 01.1	131 02.3	131 14.2	131 15.2
LC-5990-X	11977.6	11973.3	11938	11928.5
LC-5990-Z	41620.1	41618.9	41599.4	41601.2
DEPTH (F)	28	23	13	14
SPECIES CATCH(KG.)				
ARROWTOOTH FLOUNDER	-		-	
BUTTER SOLE	-		-	
C-O SOLE	-		-	
CURLFIN SOLE	TRACE		-	
DOVER SOLE	-		-	
ENGLISH SOLE	-		TRACE	
FLATHEAD SOLE	-		-	
PACIFIC HALIBUT	-		-	
PACIFIC SANDDAB	-		TRACE	
REX SOLE	-		-	
ROCK SOLE	38		16	
SAND SOLE	-		5	
SLENDER SOLE	-		-	
STARRY FLOUNDER	-		5	
YELLOWFIN SOLE	-		-	
S. FLAVIDUS	-		-	
S. MALIGER	-		-	
S. MELANOPS	-		-	
S. PINNIGER	-		-	
S. PRORIGER	-		-	
GREENLINGS	-		-	
PACIFIC HERRING	-		-	
LINGCOD	-		-	
PACIFIC COD	-		-	
PACIFIC TOMCOD	-		-	
POACHERS	-		-	
RED IRISH LORD	-		-	
SABLEFISH	-		-	
SANDLANCE	-		-	
SCULPINS	-		-	
SHINER PERCH	-		-	
WALLEYE POLLOCK	-		-	
WOLFEEL	-		-	
RATFISH	TRACE		-	
SKATES	79		-	
SPINY DOGFISH	-		3	
INVERTEBRATES	15		3	
TOTAL CATCH (KG.)	132		32	
REMARKS	USABLE		USABLE	

APPENDIX TABLE 1. BRIDGE LOG M/V DOUBLE DECKER APRIL 10-27,1984.

HAUL NO.	21	22
MAJOR AREA	5D	5D
MINOR AREA	2A EAST	2A EAST
DATE	APR 19	APR 19
DEPTH MODE F/(M)	27 /(49)	20 /(36)
DURATION (H)	0.45	0.33
DIRECTION (DEG. TRUE)	270	150

	START	STOP	START	STOP
TIME	15:29	15:56	18:06	18:26
LAT.(DEG,MIN)	53 41.6	53 42.4	53 43.7	53 43.2
LONG.(DEG,MIN)	131 15.5	131 16.7	131 18.2	131 17.7
LC-5990-X	11890.2	11880.6	11862.9	11869.8
LC-5990-Z	41617.3	41617.8	41620.5	41619.3
DEPTH (F)	27	26	20	20

SPECIES CATCH(KG.)

ARROWTOOTH FLOUNDER	-	-
BUTTER SOLE	550	-
C-O SOLE	TRACE	-
CURLFIN SOLE	TRACE	TRACE
DOVER SOLE	TRACE	-
ENGLISH SOLE	124	109
FLATHEAD SOLE	-	-
PACIFIC HALIBUT	20	18
PACIFIC SANDDAB	-	-
REX SOLE	-	-
ROCK SOLE	11	113
SAND SOLE	-	63
SLENDER SOLE	-	-
STARRY FLOUNDER	22	-
YELLOWFIN SOLE	TRACE	-
S. FLAVIDUS	-	-
S. MALIGER	-	-
S. MELANOPS	TRACE	-
S. PINNIGER	-	-
S. PRORIGER	-	-
GREENLINGS	-	-
PACIFIC HERRING	-	TRACE
LINGCOD	-	-
PACIFIC COD	-	3
PACIFIC TOMCOD	-	-
POACHERS	TRACE	-
RED IRISH LORD	-	-
SABLEFISH	-	-
SANDLANCE	-	-
SCULPINS	TRACE	TRACE
SHINER PERCH	TRACE	TRACE
WALLEYE POLLOCK	TRACE	-
WOLFEEL	-	-
RATFISH	-	-
SKATES	230	60
SPINY DOGFISH	11	2
INVERTEBRATES	425	104
TOTAL CATCH (KG.)	1393	472
REMARKS	USABLE	USABLE

APPENDIX TABLE 1. BRIDGE LOG M/V DOUBLE DECKER APRIL 10-27,1984.

HAUL NO.	23	24
MAJOR AREA	5D	5D
MINOR AREA	4	4
DATE	APR 22	APR 23
DEPTH MODE F/(M)	19 /(34)	41 /(74)
DURATION (H)	0.45	0.32
DIRECTION (DEG. TRUE)	240	240

	START	STOP	START	STOP
TIME	7:14	7:41	17:26	17:45
LAT.(DEG,MIN)	53 58.6	53 57.8	53 58.7	53 59
LONG.(DEG,MIN)	130 41.1	130 42.2	131 05.4	131 06
LC-5990-X	11888.8	11891	11791.7	11787.1
LC-5990-Z	41718.2	41715.2	41685	41686.4
DEPTH (F)	20	18	42	40

SPECIES CATCH(KG.)

ARROWTOOTH FLOUNDER	-	10
BUTTER SOLE	-	15
C-O SOLE	-	-
CURLFIN SOLE	3	TRACE
DOVER SOLE	TRACE	TRACE
ENGLISH SOLE	28	108
FLATHEAD SOLE	5	-
PACIFIC HALIBUT	TRACE	2
PACIFIC SANDDAB	10	77
REX SOLE	-	15
ROCK SOLE	24	26
SAND SOLE	-	-
SLENDER SOLE	-	-
STARRY FLOUNDER	27	-
YELLOWFIN SOLE	-	-
S. FLAVIDUS	-	TRACE
S. MALIGER	-	-
S. MELANOPS	-	-
S. PINNIGER	-	-
S. PRORIGER	-	-
GREENLINGS	-	TRACE
PACIFIC HERRING	-	-
LINGCOD	TRACE	TRACE
PACIFIC COD	-	46
PACIFIC TOMCOD	-	-
POACHERS	-	-
RED IRISH LORD	-	-
SABLEFISH	-	-
SANDLANCE	-	-
SCULPINS	-	-
SHINER PERCH	TRACE	TRACE
WALLEYE POLLOCK	-	TRACE
WOLFEEL	6	-
RATFISH	13	10
SKATES	33	30
SPINY DOGFISH	-	5
INVERTEBRATES	75	205
TOTAL CATCH (KG.)	224	549
REMARKS	USABLE	USABLE

APPENDIX TABLE 1. BRIDGE LOG M/V DOUBLE DECKER APRIL 10-27,1984.

HAUL NO.	25	26
MAJOR AREA	5D	5D
MINOR AREA	4	4
DATE	APR 23	APR 24
DEPTH MODE F/(M)	20 ((36)	14 ((25)
DURATION (H)	0.35	0.42
DIRECTION (DEG. TRUE)	275	220

	START	STOP	START	STOP
TIME	18:30	18:51	7:10	7:35
LAT.(DEG,MIN)	54 00.2	54 00.6	54 14.1	54 13.4
LONG.(DEG,MIN)	131 06.8	131 07.7	131 09.5	131 11.1
LC-5990-X	11775	11769.2	11651	11653.5
LC-5990-Z	41687.4	41689.1	41726.1	41722.4
DEPTH (F)	20	20	14	14

SPECIES CATCH(KG.)

ARROWTOOTH FLOUNDER	-	-
BUTTER SOLE	-	-
C-O SOLE	-	-
CURLFIN SOLE	TRACE	-
DOVER SOLE	TRACE	-
ENGLISH SOLE	TRACE	-
FLATHEAD SOLE	TRACE	-
PACIFIC HALIBUT	11	65
PACIFIC SANDDAB	-	-
REX SOLE	TRACE	-
ROCK SOLE	23	52
SAND SOLE	5	2
SLENDER SOLE	-	-
STARRY FLOUNDER	-	18
YELLOWFIN SOLE	-	-
S. FLAVIDUS	TRACE	-
S. MALIGER	TRACE	TRACE
S. MELANOPS	-	-
S. PINNIGER	-	-
S. PRORIGER	-	-
GREENLINGS	-	-
PACIFIC HERRING	-	-
LINGCOD	TRACE	-
PACIFIC COD	-	69
PACIFIC TOMCOD	-	-
POACHERS	-	-
RED IRISH LORD	-	-
SABLEFISH	-	-
SANDLANCE	1	-
SCULPINS	-	-
SHINER PERCH	TRACE	-
WALLEYE POLLOCK	-	-
WOLFEEL	-	-
RATFISH	TRACE	-
SKATES	73	2
SPINY DOGFISH	-	2
INVERTEBRATES	TRACE	17
TOTAL CATCH (KG.)	113	227
REMARKS	USABLE	USABLE

APPENDIX TABLE 1. BRIDGE LOG M/V DOUBLE DECKER APRIL 10-27,1984.

HAUL NO.	27	28
MAJOR AREA	5D	5D
MINOR AREA	4	4
DATE	APR 24	APR 24
DEPTH MODE F/(M)	19 /(34)	54 /(98)
DURATION (H)	0.42	0.35
DIRECTION (DEG. TRUE)	180	140

	START	STOP	START	STOP
TIME	8:39	9:04	9:49	10:10
LAT.(DEG,MIN)	54 07.7	54 06.9	54 06.8	54 06.2
LONG.(DEG,MIN)	131 08.2	131 07.4	131 04	131 04
LC-5990-X	11709.1	11717.3	11730.3	11736.5
LC-5990-Z	41709.2	41706.9	41712.7	41710.1
DEPTH (F)	20	18	55	52

SPECIES CATCH(KG.)

ARROWTOOTH FLOUNDER	TRACE	140
BUTTER SOLE	-	-
C-O SOLE	-	-
CURLFIN SOLE	-	-
DOVER SOLE	-	439
ENGLISH SOLE	3	544
FLATHEAD SOLE	-	-
PACIFIC HALIBUT	107	-
PACIFIC SANDDAB	-	-
REX SOLE	-	456
ROCK SOLE	113	-
SAND SOLE	-	-
SLENDER SOLE	-	-
STARRY FLOUNDER	-	-
YELLOWFIN SOLE	-	-
S. FLAVIDUS	-	-
S. MALIGER	6	-
S. MELANOPS	-	-
S. PINNIGER	-	-
S. PRORIGER	-	TRACE
GREENLINGS	TRACE	-
PACIFIC HERRING	-	-
LINGCOD	4	-
PACIFIC COD	3	53
PACIFIC TOMCOD	-	TRACE
POACHERS	TRACE	-
RED IRISH LORD	-	-
SABLEFISH	-	18
SANDLANCE	-	-
SCULPINS	-	-
SHINER PERCH	TRACE	-
WALLEYE POLLOCK	-	35
WOLFEEL	5	-
RATFISH	TRACE	TRACE
SKATES	120	60
SPINY DOGFISH	TRACE	-
INVERTEBRATES	542	69
TOTAL CATCH (KG.)	903	1814
REMARKS	USABLE	USABLE

APPENDIX TABLE 1. BRIDGE LOG M/V DOUBLE DECKER APRIL 10-27,1984.

HAUL NO.	29	30
MAJOR AREA	5D	5C
MINOR AREA	2A EAST	2B EAST
DATE	APR 24	APR 24
DEPTH MODE F/(M)	17 ((31)	20 ((36)
DURATION (H)	0.37	0.35
DIRECTION (DEG. TRUE)	250	160

	START	STOP	START	STOP
TIME	11:53	12:15	18:26	18:47
LAT. (DEG,MIN)	54 02.8	54 02.8	53 17	53 16.4
LONG. (DEG,MIN)	131 19	131 20.5	131 08	131 08.5
LC-5990-X	11711.4	11706.3	12102	12103.8
LC-5990-Z	41679	41677.8	41543	41540.2
DEPTH (F)	18	16	20	20

SPECIES CATCH(KG.)

ARROWTOOTH FLOUNDER	-	-
BUTTER SOLE	5	-
C-O SOLE	-	-
CURLFIN SOLE	-	TRACE
DOVER SOLE	TRACE	-
ENGLISH SOLE	4	TRACE
FLATHEAD SOLE	-	-
PACIFIC HALIBUT	46	21
PACIFIC SANDDAB	-	-
REX SOLE	TRACE	-
ROCK SOLE	8	20
SAND SOLE	-	-
SLENDER SOLE	-	-
STARRY FLOUNDER	-	-
YELLOWFIN SOLE	-	-
S. FLAVIDUS	-	-
S. MALIGER	-	-
S. MELANOPS	-	-
S. PINNIGER	-	-
S. PRORIGER	-	-
GREENLINGS	-	-
PACIFIC HERRING	TRACE	-
LINGCOD	-	TRACE
PACIFIC COD	2	-
PACIFIC TOMCOD	-	-
POACHERS	-	TRACE
RED IRISH LORD	-	-
SABLEFISH	TRACE	-
SANDLANCE	-	-
SCULPINS	TRACE	-
SHINER PERCH	2	-
WALLEYE POLLOCK	-	-
WOLFEEL	-	-
RATFISH	-	-
SKATES	152	32
SPINY DOGFISH	TRACE	10
INVERTEBRATES	19	21
TOTAL CATCH (KG.)	238	104
REMARKS	USABLE	USABLE

APPENDIX TABLE 1. BRIDGE LOG M/V DOUBLE DECKER APRIL 10-27,1984.

HAUL NO.	31
MAJOR AREA	5C
MINOR AREA	2B EAST
DATE	APR 24
DEPTH MODE F/(M)	24 /(43)
DURATION (H)	0.43
DIRECTION (DEG. TRUE)	120

	START	STOP
TIME	19:14	19:40
LAT.(DEG,MIN)	53 15.4	53 14.8
LONG.(DEG,MIN)	131 06.4	131 05.5
LC-5990-X	12119.4	12127.6
LC-5990-Z	41539.2	41537.8
DEPTH (F)	23	24

SPECIES CATCH(KG.)

ARROWTOOTH FLOUNDER	-
BUTTER SOLE	-
C-O SOLE	-
CURLFIN SOLE	TRACE
DOVER SOLE	-
ENGLISH SOLE	TRACE
FLATHEAD SOLE	-
PACIFIC HALIBUT	8
PACIFIC SANDDAB	-
REX SOLE	-
ROCK SOLE	16
SAND SOLE	-
SLENDER SOLE	-
STARRY FLOUNDER	-
YELLOWFIN SOLE	-
S. FLAVIDUS	-
S. MALIGER	-
S. MELANOPS	-
S. PINNIGER	-
S. PRORIGER	-
GREENLINGS	-
PACIFIC HERRING	-
LINGCOD	25
PACIFIC COD	-
PACIFIC TOMCOD	-
POACHERS	-
RED IRISH LORD	-
SABLEFISH	-
SANDLANCE	-
SCULPINS	-
SHINER PERCH	-
WALLEYE POLLOCK	-
WOLFEEL	-
RATFISH	-
SKATES	26
SPINY DOGFISH	25
INVERTEBRATES	TRACE
TOTAL CATCH (KG.)	100
REMARKS	USABLE

Appendix table 2. Common and scientific names of species caught on M/V DOUBLE DECKER, Hecate survey, April 10-27, 1984.

Common name	Scientific name
Flatfish	
Butter sole	*Isopsetta isolepis*
C-O sole	*Pleuronichthys coenosus*
Curlfin sole	*Pleuronichthys decurrens*
Dover sole	*Microstomus pacificus*
English sole	*Parophrys vetulus*
Flathead sole	*Hippoglossoides elassodon*
Pacific halibut	*Hippoglossus stenolepis*
Pacific sanddab	*Citharichthys sordidus*
Rex sole	*Glyptocephalus zachirus*
Rock sole	*Lepidopsetta bilineata*
Sand sole	*Psettichthys melanostictus*
Slender sole	*Lyopsetta exilis*
Starry flounder	*Platichthys stellatus*
Turbot	*Atheresthes stomias*
Yellowfin sole	*Limanda aspera*
Rockfish	
Black rockfish	*Sebastes melanops*
Canary rockfish	*Sebastes pinniger*
Quillback rockfish	*Sebastes maliger*
Redstripe rockfish	*Sebastes proriger*
Yellowtail rockfish	*Sebastes flavidus*
Roundfish	
Buffalo sculpin	*Enophrys bison*
Kelp greenling	*Hexagrammos decagrammus*
Lingcod	*Ophiodon elongatus*
Pacific cod	*Gadus macrocephalus*
Pacific herring	*Clupea harengus pallasi*
Pacific sandlance	*Ammodytes hexapterus*
Pacific tomcod	*Microgadus proximus*
Red Irish lord	*Hemilepidotus hemilepidotas*

Appendix table 2 (cont'd)

Common name	Scientific name
Roundfish	
Sablefish	*Anoplopoma fimbria*
Shiner perch	*Cymatogaster aggregata*
Sturgeon poacher	*Agonus acipenserinus*
Walleye pollock	*Theragra chalcogramma*
Wolfeel	*Anarrhichthys ocellatus*
Selachii	
Big skate	*Raja binoculata*
Ratfish	*Hydrolagus colliei*
Spiny dogfish	*Squalus acanthias*
Invertebrates	
Anemone	Actiniaria
Barnacles	Cirripedia
Crabs	Galatheoidae
Hermit crabs	Paguridae
Moon snails	Naticidae
Nudibranchs	*Nudibranchia*
Octopus	*Octopoda*
Opal squid	*Loligo opalescens*
Sea cucumber	Holothuroidea
Sea pens	Pennatulacea
Sea urchins	Echinoidea
Sponges	Porifera
Starfish	Asteroidea

Appendix Table 3. Rock sole length frequencies (numbers) by haul.
M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	1				2				3				4			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-
12	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-
13	-	-	7	7	-	-	-	-	-	-	2	2	-	-	-	-
14	-	-	6	6	-	-	1	1	-	-	1	1	-	-	-	-
15	-	-	11	11	-	-	1	1	-	-	0	0	-	-	1	1
16	-	-	21	21	-	-	0	0	-	-	0	0	-	-	4	4
17	-	-	53	53	-	-	0	0	-	-	0	0	-	-	1	1
18	-	-	54	54	-	-	2	2	-	-	1	1	-	-	0	0
19	-	-	44	44	-	-	1	1	-	-	-	0	-	-	1	1
20	-	-	23	23	-	-	-	0	-	-	-	0	-	-	-	0
21	28	10	-	38	1	-	-	1	-	-	-	0	1	2	-	3
22	10	5	-	15	1	-	-	1	-	-	-	0	0	0	-	0
23	14	13	-	27	0	-	-	0	-	-	-	0	1	0	-	1
24	7	9	-	16	0	-	-	0	-	-	-	0	0	0	-	0
25	6	6	-	12	1	-	-	1	-	-	-	0	0	1	-	1
26	4	4	-	8	-	-	-	0	-	-	-	0	0	0	-	0
27	2	2	-	4	-	-	-	0	1	-	-	1	0	0	-	0
28	1	0	-	1	-	-	-	0	0	-	-	0	0	0	-	0
29	1	1	-	2	-	-	-	0	0	-	-	0	0	0	-	0
30	0	0	-	0	-	-	-	0	1	2	-	3	0	0	-	0
31	1	1	-	2	-	1	-	1	0	2	-	2	0	0	-	0
32	1	0	-	1	-	0	-	0	0	2	-	2	0	0	-	0
33	-	0	-	0	-	1	-	1	1	0	-	1	0	0	-	0
34	-	1	-	1	-	1	-	1	-	0	-	0	0	0	-	0
35	-	0	-	0	-	0	-	0	-	0	-	0	0	0	-	0
36	-	0	-	0	-	0	-	0	-	0	-	0	0	0	-	0
37	-	0	-	0	-	2	-	2	-	0	-	0	0	1	-	1
38	-	1	-	1	-	0	-	0	-	1	-	1	0	2	-	2
39	-	0	-	0	-	3	-	3	-	2	-	2	0	2	-	2
40	-	0	-	0	-	2	-	2	-	2	-	2	0	2	-	2
41	-	0	-	0	-	2	-	2	-	1	-	1	1	1	-	2
42	-	0	-	0	-	1	-	1	-	2	-	2	-	4	-	4
43	-	0	-	0	-	1	-	1	-	2	-	2	-	1	-	1
44	-	0	-	0	-	1	-	1	-	3	-	3	-	2	-	2
45	-	0	-	0	-	3	-	3	-	3	-	3	-	0	-	0
46	-	1	-	1	-	1	-	1	-	0	-	0	-	2	-	2
47	-	-	-	-	-	0	-	0	-	1	-	1	-	1	-	1
48	-	-	-	-	-	0	-	0	-	0	-	0	-	3	-	3
49	-	-	-	-	-	1	-	1	-	1	-	1	-	-	-	-
50	-	-	-	-	-	0	-	0	-	3	-	3	-	-	-	-
51	-	-	-	-	-	1	-	1	-	1	-	1	-	-	-	-
52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	75	54	220	349	3	21	5	29	3	26	4	33	3	22	7	32

Appendix Table 3. Rock sole length frequencies (numbers) by haul. M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	5				6				7				8			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	1	1	-	-	-	-	-	-	1	1
13	-	-	-	-	-	-	2	2	-	-	-	-	-	-	2	2
14	-	-	-	-	-	-	8	8	-	-	1	1	-	-	1	1
15	-	-	-	-	-	-	4	4	-	-	1	1	-	-	0	0
16	-	-	-	-	-	-	6	6	-	-	0	0	-	-	0	0
17	-	-	-	-	-	-	7	7	-	-	1	1	-	-	0	0
18	-	-	-	-	-	-	10	10	-	-	0	0	-	-	0	0
19	-	-	-	-	-	-	5	5	-	-	1	1	-	-	1	1
20	-	-	-	-	-	-	2	2	-	-	1	1	2	1	-	3
21	-	-	-	-	-	7	-	12	-	-	-	0	0	1	-	1
22	1	-	-	1	5	4	-	7	2	-	-	2	1	0	-	2
23	1	-	-	1	2	0	-	2	0	-	-	0	2	0	-	2
24	0	-	-	0	4	2	-	6	0	-	-	0	1	0	-	1
25	0	-	-	0	2	1	-	3	0	-	-	0	0	0	-	0
26	4	-	-	4	2	1	-	3	0	-	-	0	0	1	-	1
27	1	-	-	1	1	0	-	1	0	-	-	0	0	0	-	0
28	2	-	-	2	2	1	-	3	0	1	-	1	2	0	-	2
29	5	1	-	6	0	0	-	0	1	0	-	1	3	0	-	3
30	5	1	-	6	1	0	-	1	0	1	-	1	1	1	-	2
31	6	0	-	6	1	0	-	1	0	7	-	7	1	3	-	4
32	9	0	-	9	4	1	-	5	1	11	-	12	2	8	-	10
33	11	1	-	12	2	0	-	2	0	5	-	5	6	6	-	12
34	13	3	-	16	3	0	-	3	1	6	-	7	4	10	-	14
35	5	2	-	7	4	4	-	8	-	3	-	3	2	9	-	11
36	4	2	-	6	5	1	-	6	-	3	-	3	1	10	-	11
37	6	3	-	9	7	4	-	11	-	3	-	3	-	12	-	12
38	2	3	-	5	2	4	-	6	-	4	-	4	-	9	-	9
39	1	5	-	6	3	2	-	5	-	12	-	12	-	7	-	7
40	-	6	-	6	-	4	-	4	-	3	-	3	-	12	-	12
41	-	4	-	4	-	10	-	10	-	5	-	5	-	12	-	12
42	-	6	-	6	-	6	-	6	-	5	-	5	-	10	-	10
43	-	9	-	9	-	10	-	10	-	4	-	4	-	9	-	9
44	-	4	-	4	-	11	-	11	-	3	-	3	-	4	-	4
45	-	2	-	2	-	9	-	9	-	1	-	1	-	7	-	7
46	-	5	-	5	-	5	-	5	-	1	-	1	-	8	-	8
47	-	2	-	2	-	7	-	7	-	0	-	0	-	0	-	0
48	-	3	-	3	-	3	-	3	-	1	-	1	-	2	-	2
49	-	2	-	2	-	4	-	4	-	-	-	-	-	-	-	-
50	-	1	-	1	-	2	-	2	-	-	-	-	-	-	-	-
51	-	-	-	-	-	0	-	0	-	-	-	-	-	-	-	-
52	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-
53	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	76	65	0	141	55	105	46	206	5	79	5	89	28	141	5	174

Appendix Table 3. Rock sole length frequencies (numbers) by haul. M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	9				10				11				12			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
10	-	-	-	-	-	-	1	1	-	-	-	-	-	-	0	0
11	-	-	1	1	-	-	0	0	-	-	-	-	-	-	0	0
12	-	-	0	0	-	-	0	0	-	-	-	-	-	-	0	0
13	-	-	0	0	-	-	0	0	-	-	-	-	-	-	0	0
14	-	-	1	1	-	-	1	1	-	-	1	1	-	-	1	2
15	-	-	0	0	-	-	0	0	-	-	1	1	-	-	2	2
16	-	-	1	1	-	-	1	1	-	-	1	1	-	-	0	0
17	-	-	0	0	-	-	1	1	-	-	-	0	-	-	0	0
18	-	-	0	0	-	-	-	0	-	-	-	0	-	-	1	1
19	-	-	1	1	-	-	-	0	-	-	-	0	-	-	3	3
20	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0
21	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0
22	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0
23	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0
24	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0
25	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0
26	-	-	-	0	-	1	-	1	-	-	-	0	-	-	-	0
27	-	-	-	0	-	0	-	0	-	1	-	1	-	-	-	0
28	-	-	-	0	-	0	-	0	-	0	-	0	1	-	-	1
29	-	-	-	0	-	0	-	0	-	0	-	0	1	-	-	1
30	-	-	-	0	-	0	-	0	-	0	-	0	0	2	-	2
31	1	1	-	2	1	1	-	2	-	0	-	0	0	2	-	2
32	1	0	-	1	1	1	-	2	1	0	-	1	0	0	-	1
33	5	1	-	6	1	0	-	1	0	0	-	0	1	0	-	1
34	4	2	-	6	-	0	-	0	1	1	-	2	1	0	-	1
35	6	1	-	7	-	0	-	0	1	1	-	2	-	3	-	3
36	-	6	-	6	-	2	-	2	1	0	-	1	-	1	-	1
37	-	6	-	6	-	0	-	0	2	1	-	3	-	2	-	2
38	-	10	-	10	-	3	-	3	1	4	-	5	-	2	-	2
39	-	11	-	11	-	1	-	1	-	4	-	4	-	3	-	3
40	-	19	-	19	-	1	-	1	-	7	-	7	-	8	-	8
41	-	6	-	6	-	1	-	1	-	5	-	5	-	3	-	3
42	-	12	-	12	-	1	-	1	-	5	-	5	-	9	-	9
43	-	4	-	4	-	-	-	-	-	3	-	3	-	4	-	4
44	-	11	-	11	-	-	-	-	-	5	-	5	-	4	-	4
45	-	3	-	3	-	-	-	-	-	2	-	2	-	2	-	2
46	-	2	-	2	-	-	-	-	-	1	-	1	-	1	-	1
47	-	1	-	1	-	-	-	-	-	3	-	3	-	1	-	1
48	-	-	-	-	-	-	-	-	-	1	-	1	-	0	-	0
49	-	-	-	-	-	-	-	-	-	0	-	0	-	0	-	0
50	-	-	-	-	-	-	-	-	-	0	-	0	-	0	-	0
51	-	-	-	-	-	-	-	-	-	1	-	1	-	1	-	1
52	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-
53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	17	96	4	117	3	12	4	19	6	46	3	55	4	48	8	60

Appendix Table 3. Rock sole length frequencies (numbers) by haul. M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	13				14				15				16			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	3	3	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
11	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	0	0	-	-	1	1
13	-	-	1	1	-	-	-	-	-	-	0	0	-	-	0	0
14	-	-	0	0	-	-	-	-	-	-	3	3	-	-	0	0
15	-	-	0	0	-	-	-	-	-	-	7	7	-	-	0	0
16	-	-	0	0	-	-	1	1	-	-	12	12	-	-	1	1
17	-	-	1	1	-	-	0	0	-	-	20	20	-	-	1	1
18	-	-	1	1	-	-	2	2	-	-	15	15	-	-	-	0
19	-	-	-	0	-	-	1	1	-	-	11	11	-	-	-	0
20	-	-	-	0	-	-	3	3	-	-	14	14	1	-	-	1
21	1	1	-	2	2	3	-	5	8	4	-	12	0	-	-	0
22	1	1	-	2	1	2	-	3	9	10	-	19	2	-	-	2
23	1	4	-	5	2	3	-	5	7	4	-	11	0	-	-	0
24	1	0	-	1	2	2	-	4	9	3	-	12	0	-	-	0
25	2	1	-	3	1	1	-	2	5	2	-	7	0	-	-	0
26	2	1	-	3	1	0	-	1	4	2	-	6	0	-	-	0
27	2	1	-	3	-	0	-	0	1	1	-	2	0	-	-	0
28	0	3	-	3	-	0	-	0	1	0	-	1	0	-	-	0
29	0	1	-	1	-	0	-	0	1	1	-	2	2	-	-	2
30	0	2	-	2	-	1	-	1	-	0	-	0	2	-	-	2
31	0	1	-	1	-	1	-	1	-	2	-	2	2	-	-	2
32	2	0	-	2	-	-	-	-	-	1	-	1	2	-	-	2
33	-	0	-	0	-	-	-	-	-	0	-	0	4	1	-	5
34	-	2	-	2	-	-	-	-	-	0	-	0	1	1	-	2
35	-	0	-	0	-	-	-	-	-	1	-	1	4	0	-	4
36	-	0	-	0	-	-	-	-	-	-	-	-	2	3	-	5
37	-	2	-	2	-	-	-	-	-	-	-	-	2	0	-	2
38	-	0	-	0	-	-	-	-	-	-	-	-	1	0	-	1
39	-	1	-	1	-	-	-	-	-	-	-	-	0	1	-	1
40	-	1	-	1	-	-	-	-	-	-	-	-	1	1	-	2
41	-	1	-	1	-	-	-	-	-	-	-	-	-	1	-	1
42	-	0	-	0	-	-	-	-	-	-	-	-	-	3	-	3
43	-	1	-	1	-	-	-	-	-	-	-	-	-	1	-	1
44	-	3	-	3	-	-	-	-	-	-	-	-	-	1	-	1
45	-	1	-	1	-	-	-	-	-	-	-	-	-	0	-	0
46	-	0	-	0	-	-	-	-	-	-	-	-	-	1	-	1
47	-	0	-	0	-	-	-	-	-	-	-	-	-	2	-	2
48	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
49	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-
50	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
51	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
52	-	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
53	-	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
54	-	0	-	0	-	-	-	-	-	-	-	-	-	-	-	-
55	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	12	34	3	49	9	13	7	29	44	31	85	160	26	16	3	45

Appendix Table 3. Rock sole length frequencies (numbers) by haul. M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	17				18				19				20			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
8	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	0	0	-	-	0	0
10	-	-	-	-	-	-	3	3	-	-	2	2	-	-	0	0
11	-	-	-	-	-	-	2	2	-	-	2	2	-	-	0	0
12	-	-	-	-	-	-	1	1	-	-	0	0	-	-	0	0
13	-	-	1	1	-	-	2	2	-	-	5	5	-	-	0	0
14	-	-	1	1	-	-	3	3	-	-	5	5	-	-	1	1
15	-	-	1	1	-	-	6	6	-	-	1	1	-	-	-	-
16	-	-	-	-	-	-	2	2	-	-	6	6	-	-	-	-
17	-	-	-	-	-	-	4	4	-	-	3	3	-	-	-	-
18	-	-	-	-	-	-	4	4	-	-	6	6	-	-	-	-
19	-	-	-	-	-	-	4	4	-	-	-	-	-	-	-	-
20	-	-	-	-	5	2	-	7	3	-	-	3	-	-	-	-
21	-	-	-	-	2	0	-	2	1	3	-	4	-	-	-	-
22	-	-	-	-	3	1	-	4	2	1	-	3	-	-	-	-
23	-	-	-	-	3	1	-	4	0	2	-	2	-	-	-	-
24	-	-	-	-	5	0	-	5	0	1	-	1	-	-	-	-
25	1	-	-	1	3	0	-	3	1	0	-	1	-	-	-	-
26	0	1	-	1	9	6	-	15	2	1	-	3	-	-	-	-
27	0	0	-	0	20	3	-	23	3	0	-	3	-	-	-	-
28	1	0	-	1	39	2	-	41	1	1	-	2	3	-	-	3
29	1	0	-	1	38	2	-	40	2	2	-	4	2	-	-	2
30	0	1	-	1	33	6	-	39	3	2	-	5	1	1	-	2
31	1	2	-	3	19	5	-	24	1	5	-	6	3	2	-	5
32	1	3	-	4	15	5	-	20	-	3	-	3	4	0	-	4
33	3	3	-	6	11	7	-	18	-	2	-	2	2	1	-	3
34	3	5	-	8	9	10	-	19	-	3	-	3	1	2	-	3
35	2	2	-	4	3	6	-	9	-	4	-	4	1	3	-	4
36	0	5	-	5	3	7	-	10	-	3	-	3	-	0	-	0
37	2	0	-	2	0	5	-	5	-	1	-	1	-	1	-	1
38	0	5	-	5	1	4	-	5	-	3	-	3	-	-	-	-
39	1	1	-	2	-	3	-	3	-	2	-	2	-	-	-	-
40	0	4	-	4	-	2	-	2	-	1	-	1	-	-	-	-
41	0	1	-	1	-	6	-	6	-	0	-	0	-	-	-	-
42	0	1	-	1	-	3	-	3	-	1	-	1	-	-	-	-
43	0	0	-	0	-	1	-	1	-	0	-	0	-	-	-	-
44	0	1	-	1	-	0	-	0	-	1	-	1	-	-	-	-
45	0	0	-	0	-	1	-	1	-	0	-	0	-	-	-	-
46	0	1	-	1	-	0	-	0	-	1	-	1	-	-	-	-
47	0	0	-	0	-	0	-	0	-	0	-	0	-	-	-	-
48	0	0	-	0	-	0	-	0	-	0	-	0	-	-	-	-
49	0	0	-	0	-	0	-	0	-	1	-	1	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	4	37	3	44	224	90	31	345	23	47	32	102	20	11	2	33

Appendix Table 3. Rock sole length frequencies (numbers) by haul. M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	21				22				23				24			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
7	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
11	-	-	-	-	-	-	2	2	-	-	1	1	-	-	-	-
12	-	-	-	-	-	-	2	2	-	-	0	0	-	-	-	-
13	-	-	-	-	-	-	1	1	-	-	2	2	-	-	-	-
14	-	-	-	-	-	-	0	0	-	-	1	1	-	-	-	-
15	-	-	-	-	-	-	1	1	-	-	0	0	-	-	-	-
16	-	-	-	-	-	-	1	1	-	-	0	0	-	-	2	2
17	-	-	-	-	-	-	2	2	-	-	0	0	-	-	1	1
18	-	-	-	-	-	-	2	2	-	-	1	1	-	-	9	9
19	-	-	-	-	-	-	5	5	-	-	2	2	-	-	7	7
20	-	-	1	1	-	-	1	1	-	-	-	0	-	-	5	5
21	-	-	0	0	1	1	-	2	1	-	-	1	-	-	0	0
22	-	-	0	0	0	0	-	0	1	-	-	1	-	-	1	1
23	-	-	0	0	1	0	-	1	1	-	-	1	1	-	2	2
24	-	-	0	0	1	0	-	1	1	1	-	2	2	-	5	5
25	-	-	0	0	1	0	-	1	2	4	-	6	1	3	1	4
26	-	-	0	0	0	0	-	0	1	3	-	4	3	1	0	4
27	-	-	0	0	2	0	-	2	3	4	-	7	0	0	1	1
28	-	-	0	0	0	0	-	0	2	4	-	6	1	0	0	1
29	-	-	0	0	1	0	-	1	3	5	-	8	-	0	1	1
30	-	-	0	0	2	3	-	5	2	3	-	5	-	1	-	1
31	-	-	0	0	1	2	-	3	-	7	-	7	-	-	-	-
32	-	-	1	1	4	9	-	13	-	2	-	2	-	-	-	-
33	-	-	0	0	1	7	-	8	-	2	-	2	-	-	-	-
34	-	-	0	0	3	10	-	13	-	1	-	1	-	-	-	-
35	-	-	0	0	4	8	-	12	-	6	-	6	-	-	-	-
36	-	-	1	1	2	11	-	13	-	4	-	4	-	-	-	-
37	-	-	0	0	1	8	-	9	-	2	-	2	-	-	-	-
38	-	-	0	0	0	7	-	7	-	1	-	1	-	-	-	-
39	-	-	1	1	1	7	-	8	-	0	-	0	-	-	-	-
40	-	-	0	0	-	7	-	7	-	1	-	1	-	-	-	-
41	-	-	0	0	-	13	-	13	-	1	-	1	-	-	-	-
42	-	-	1	1	-	12	-	12	-	-	-	-	-	-	-	-
43	-	-	-	-	-	5	-	5	-	-	-	-	-	-	-	-
44	-	-	-	-	-	6	-	6	-	-	-	-	-	-	-	-
45	-	-	-	-	-	5	-	5	-	-	-	-	-	-	-	-
46	-	-	-	-	-	4	-	4	-	-	-	-	-	-	-	-
47	-	-	-	-	-	0	-	0	-	-	-	-	-	-	-	-
48	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-
49	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	0	0	5	5	25	127	17	169	17	51	10	78	10	5	24	39

Appendix Table 3. Rock sole length frequencies (numbers) by haul. M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	25				26				27				29			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4
10	-	-	-	-	-	-	-	-	-	-	2	2	-	-	0	0
11	-	-	3	3	-	-	-	-	-	-	1	1	-	-	3	3
12	-	-	4	4	-	-	-	-	-	-	1	1	-	-	1	1
13	-	-	2	2	-	-	-	-	-	-	1	1	-	-	2	2
14	-	-	6	6	-	-	-	-	-	-	4	4	-	-	1	1
15	-	-	1	1	-	-	-	-	-	-	4	4	-	-	6	6
16	-	-	3	3	-	-	-	-	-	-	5	5	-	-	5	5
17	-	-	3	3	-	-	-	-	-	-	4	4	-	-	7	7
18	-	-	2	2	-	-	-	-	-	-	8	8	-	-	11	11
19	-	-	6	6	-	-	-	-	-	-	5	5	-	-	6	6
20	-	-	1	1	-	-	-	-	-	-	4	4	-	-	4	4
21	1	-	-	1	-	-	-	-	1	-	-	1	-	2	-	2
22	1	-	-	1	1	-	-	1	4	2	-	6	-	-	-	-
23	0	-	-	0	0	-	-	0	0	1	-	1	-	-	-	-
24	0	-	-	0	0	-	-	0	1	1	-	2	-	-	-	-
25	0	3	-	3	0	-	-	0	1	2	-	3	-	-	-	-
26	0	3	-	3	1	-	-	1	0	0	-	0	-	-	-	-
27	0	0	-	0	1	-	-	1	3	0	-	3	-	-	-	-
28	0	0	-	0	1	-	-	1	3	0	-	3	-	-	-	-
29	0	0	-	0	0	1	-	1	5	2	-	7	-	-	-	-
30	1	0	-	1	1	1	-	2	5	2	-	7	-	-	-	-
31	1	2	-	3	1	0	-	1	1	4	-	5	-	-	-	-
32	2	3	-	5	1	0	-	1	2	5	-	7	-	-	-	-
33	1	3	-	4	1	1	-	2	0	8	-	8	-	-	-	-
34	1	5	-	6	1	1	-	2	2	6	-	8	-	-	-	-
35	-	5	-	5	1	4	-	5	2	8	-	10	-	-	-	-
36	-	1	-	1	2	3	-	5	1	6	-	7	-	-	-	-
37	-	1	-	1	2	0	-	2	1	8	-	9	-	-	-	-
38	-	0	-	0	1	6	-	7	-	9	-	9	-	-	-	-
39	-	3	-	3	-	3	-	3	-	14	-	14	-	-	-	-
40	-	2	-	2	-	4	-	4	-	16	-	16	-	-	-	-
41	-	1	-	1	-	5	-	5	-	8	-	8	-	-	-	-
42	-	3	-	3	-	2	-	2	-	11	-	11	-	-	-	-
43	-	1	-	1	-	2	-	2	-	4	-	4	-	-	-	-
44	-	0	-	0	-	7	-	7	-	3	-	3	-	-	-	-
45	-	0	-	0	-	5	-	5	-	6	-	6	-	-	-	-
46	-	0	-	0	-	2	-	2	-	4	-	4	-	-	-	-
47	-	1	-	1	-	2	-	2	-	5	-	5	-	-	-	-
48	-	-	-	-	-	1	-	1	-	2	-	2	-	-	-	-
49	-	-	-	-	-	0	-	0	-	0	-	0	-	-	-	-
50	-	-	-	-	-	0	-	0	-	0	-	0	-	-	-	-
51	-	-	-	-	-	0	-	0	-	1	-	1	-	-	-	-
52	-	-	-	-	-	2	-	2	-	1	-	1	-	-	-	-
53	-	-	-	-	-	1	-	1	-	1	-	1	-	-	-	-
54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	8	37	31	76	15	53	0	68	32	140	39	211	0	2	51	53

Appendix Table 3. Rock sole length frequencies (numbers) by haul.
M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	30				31			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T
7	-	-	-	-	-	-	-	-
8	-	-	1	1	-	-	-	-
9	-	-	0	0	-	-	-	-
10	-	-	0	0	-	-	-	-
11	-	-	0	0	-	-	-	-
12	-	-	1	1	-	-	-	-
13	-	-	0	0	-	-	-	-
14	-	-	0	0	-	-	-	-
15	-	-	0	0	-	-	1	1
16	-	-	1	1	-	-	0	0
17	-	-	-	0	-	-	0	0
18	-	-	-	0	-	-	3	3
19	-	-	-	0	-	-	2	2
20	-	-	-	0	-	-	1	1
21	-	1	-	1	-	-	-	0
22	-	0	-	0	-	-	-	0
23	-	0	-	0	1	-	-	1
24	1	0	-	1	1	2	-	3
25	0	2	-	2	1	0	-	1
26	0	0	-	0	0	1	-	1
27	0	0	-	0	3	0	-	3
28	0	0	-	0	-	0	-	0
29	0	0	-	0	-	0	-	0
30	1	1	-	2	-	0	-	0
31	1	0	-	1	-	0	-	0
32	1	0	-	1	-	2	-	2
33	-	0	-	0	-	1	-	1
34	-	0	-	0	-	1	-	1
35	-	0	-	0	-	1	-	1
36	-	1	-	1	-	1	-	1
37	-	1	-	1	-	1	-	1
38	-	1	-	1	-	1	-	1
39	-	3	-	3	-	0	-	0
40	-	1	-	1	-	2	-	2
41	-	1	-	1	-	1	-	1
42	-	1	-	1	-	1	-	1
43	-	2	-	2	-	1	-	1
44	-	2	-	2	-	1	-	1
45	-	1	-	1	-	0	-	0
46	-	1	-	1	-	2	-	2
47	-	1	-	1	-	-	-	-
48	-	-	-	-	-	-	-	-
49	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-
51	-	-	-	-	-	-	-	-
52	-	-	-	-	-	-	-	-
53	-	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-
TOTAL	4	20	3	27	6	19	7	32

Appendix Table 4. English sole length frequencies (numbers) by haul. M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	1				2				3				7			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	10	10	-	-	2	2	-	-	4	4	-	-	-	-
11	-	-	27	27	-	-	2	2	-	-	12	12	-	-	-	-
12	-	-	24	24	-	-	4	4	-	-	7	7	-	-	-	-
13	-	-	5	5	-	-	-	-	-	-	2	2	-	-	-	-
14	-	-	1	1	-	-	-	-	-	-	1	1	-	-	-	-
15	-	-	4	4	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-
17	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-
18	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	0	0	75	75	0	0	8	8	0	0	26	26	0	0	1	1

Appendix Table 4. English sole length frequencies (numbers) by haul. M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	8				10				11				13			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	6	6	-	-	1	1	-	-	-	-
11	-	-	-	-	-	-	23	23	-	-	1	1	-	-	-	-
12	-	-	-	-	-	-	23	23	-	-	3	3	-	-	2	2
13	-	-	1	1	-	-	8	8	-	-	1	1	-	-	-	-
14	-	-	0	0	-	-	1	1	-	-	1	1	-	-	-	-
15	-	-	1	1	-	-	2	2	-	-	0	0	-	-	-	-
16	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
18	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	0	0	2	2	0	0	64	64	0	0	8	8	0	0	2	2

Appendix Table 4. English sole length frequencies (numbers) by haul. M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	14				15				20				21			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	8
10	-	-	8	8	-	-	-	-	-	-	-	-	-	-	39	39
11	-	-	18	18	-	-	2	2	-	-	2	2	-	-	124	124
12	-	-	23	23	-	-	4	4	-	-	-	-	-	-	123	123
13	-	-	31	31	-	-	6	6	-	-	-	-	-	-	88	88
14	-	-	44	44	-	-	6	6	-	-	-	-	-	-	34	34
15	-	-	92	92	-	-	5	5	-	-	-	-	-	-	7	7
16	-	-	63	63	-	-	5	5	-	-	-	-	-	-	5	5
17	-	-	46	46	-	-	3	3	-	-	-	-	-	-	8	8
18	-	-	36	36	-	-	4	4	-	-	-	-	-	-	14	14
19	-	-	36	36	-	-	0	0	-	-	-	-	-	-	17	17
20	-	-	25	25	-	-	0	0	-	-	-	-	-	-	9	9
21	12	10	-	22	-	-	1	1	-	-	-	-	3	3	-	6
22	17	8	-	25	-	-	-	0	-	-	-	-	0	1	-	1
23	10	4	-	14	-	-	-	0	-	-	-	-	1	0	-	1
24	8	6	-	14	-	-	-	0	-	-	-	-	1	2	-	3
25	14	7	-	21	-	-	-	0	-	-	-	-	2	2	-	4
26	13	4	-	17	-	-	-	0	-	-	-	-	2	0	-	2
27	13	2	-	15	-	-	-	0	-	-	-	-	3	0	-	3
28	15	5	-	20	-	-	-	0	-	-	-	-	0	0	-	0
29	10	9	-	19	-	-	-	0	-	-	-	-	1	0	-	1
30	8	2	-	10	-	-	-	0	-	-	-	-	1	1	-	2
31	5	5	-	10	-	-	-	0	-	-	-	-	1	1	-	2
32	10	8	-	18	-	1	-	1	-	-	-	-	0	0	-	0
33	6	7	-	13	-	0	-	0	-	-	-	-	0	1	-	1
34	3	9	-	12	-	0	-	0	-	-	-	-	0	2	-	2
35	3	6	-	9	-	1	-	1	-	-	-	-	0	0	-	0
36	4	8	-	12	-	2	-	2	-	-	-	-	0	1	-	1
37	2	6	-	8	-	1	-	1	-	-	-	-	1	0	-	1
38	1	3	-	4	-	1	-	1	-	-	-	-	-	2	-	2
39	0	5	-	5	-	1	-	1	-	-	-	-	-	1	-	1
40	1	4	-	5	-	3	-	3	-	-	-	-	-	0	-	0
41	-	4	-	4	-	6	-	6	-	-	-	-	-	0	-	0
42	-	3	-	3	-	1	-	1	-	-	-	-	-	0	-	0
43	-	3	-	3	-	3	-	3	-	-	-	-	-	1	-	1
44	-	1	-	1	-	3	-	3	-	-	-	-	-	0	-	0
45	-	0	-	0	-	4	-	4	-	-	-	-	-	0	-	0
46	-	0	-	0	-	2	-	2	-	-	-	-	-	0	-	0
47	-	1	-	1	-	1	-	1	-	-	-	-	-	0	-	0
48	-	-	-	-	-	0	-	0	-	-	-	-	-	0	-	0
49	-	-	-	-	-	1	-	1	-	-	-	-	-	1	-	1
50	-	-	-	-	-	1	-	1	-	-	-	-	-	0	-	0
51	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0
52	-	-	-	-	-	-	-	-	-	-	+	-	-	1	-	1
TOTAL	155	130	422	707	0	32	36	68	0	0	2	2	16	18	476	510

Appendix Table 4. English sole length frequencies (numbers) by haul. M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	22				23				24				27			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	7	7	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	58	58	-	-	1	1	-	-	-	-	-	-	-	-
10	-	-	207	207	-	-	8	8	-	-	-	-	-	-	1	1
11	-	-	170	170	-	-	37	37	-	-	-	-	-	-	2	2
12	-	-	83	83	-	-	20	20	-	-	2	2	-	-	2	2
13	-	-	18	18	-	-	14	14	-	-	1	1	-	-	0	0
14	-	-	9	9	-	-	9	9	-	-	4	4	-	-	1	1
15	-	-	3	3	-	-	6	6	-	-	0	0	-	-	2	2
16	-	-	2	2	-	-	7	7	-	-	2	2	-	-	0	0
17	-	-	0	0	-	-	4	4	-	-	2	2	-	-	0	0
18	-	-	2	2	-	-	3	3	-	-	6	6	-	-	0	0
19	-	-	0	0	-	-	1	1	-	-	4	4	-	-	0	0
20	-	-	2	2	-	-	2	2	-	-	13	13	-	-	1	1
21	-	-	-	0	-	-	-	0	3	6	-	9	-	-	-	-
22	-	-	-	0	-	-	-	0	5	7	-	12	-	-	-	-
23	-	-	-	0	-	-	-	0	3	5	-	8	-	-	-	-
24	-	-	-	0	-	-	-	0	4	1	-	5	-	-	-	-
25	1	-	-	1	-	-	-	0	6	3	-	9	-	-	-	-
26	0	-	-	0	-	-	-	0	5	6	-	11	-	-	-	-
27	0	-	-	0	-	-	-	0	0	3	-	3	-	-	-	-
28	0	-	-	0	-	-	-	0	5	5	-	10	-	1	-	1
29	0	1	-	1	-	-	-	0	5	3	-	8	-	0	-	0
30	0	0	-	0	1	-	-	1	2	1	-	3	-	0	-	0
31	0	0	-	0	-	-	-	0	0	6	-	6	-	1	-	1
32	0	0	-	0	-	-	-	0	2	2	-	4	1	1	-	2
33	0	0	-	0	-	-	-	0	-	1	-	1	1	0	-	1
34	0	0	-	0	-	-	-	0	-	0	-	0	-	1	-	1
35	0	0	-	0	-	1	-	1	-	1	-	1	-	0	-	0
36	0	0	-	0	-	0	-	0	-	0	-	0	-	1	-	1
37	2	1	-	3	-	2	-	2	-	1	-	1	-	1	-	1
38	-	0	-	0	-	3	-	3	-	1	-	1	-	-	-	-
39	-	1	-	1	-	3	-	3	-	1	-	1	-	-	-	-
40	-	1	-	1	-	4	-	4	-	0	-	0	-	-	-	-
41	-	1	-	1	-	5	-	5	-	1	-	1	-	-	-	-
42	-	0	-	0	-	1	-	1	-	1	-	1	-	-	-	-
43	-	0	-	0	-	4	-	4	-	0	-	0	-	-	-	-
44	-	1	-	1	-	1	-	1	-	0	-	0	-	-	-	-
45	-	0	-	0	-	5	-	5	-	0	-	0	-	-	-	-
46	-	1	-	1	-	3	-	3	-	0	-	0	-	-	-	-
47	-	1	-	1	-	3	-	3	-	1	-	1	-	-	-	-
48	-	1	-	1	-	2	-	2	-	1	-	1	-	-	-	-
49	-	2	-	2	-	2	-	2	-	-	-	-	-	-	-	-
50	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-
51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	3	13	563	579	1	39	112	152	40	57	34	131	2	6	9	17

Appendix Table 4. English sole length frequencies (numbers) by haul. M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	28				29				30				31			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-
7	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-
8	-	-	-	-	-	-	1	1	-	-	-	0	-	-	-	-
9	-	-	-	-	-	-	6	6	-	-	-	0	-	-	-	-
10	-	-	-	-	-	-	20	20	-	-	-	0	-	-	-	-
11	-	-	-	-	-	-	32	32	-	-	-	0	-	-	-	-
12	-	-	-	-	-	-	32	32	-	-	-	0	-	-	-	-
13	-	-	1	1	-	-	14	14	-	-	-	0	-	-	1	1
14	-	-	0	0	-	-	3	3	-	-	-	0	-	-	0	0
15	-	-	1	1	-	-	1	1	-	-	-	0	-	-	0	0
16	-	-	0	0	-	-	0	0	-	-	-	0	-	-	0	0
17	-	-	0	0	-	-	1	1	-	-	-	0	-	-	0	0
18	-	-	0	0	-	-	-	0	-	-	-	0	-	-	0	0
19	-	-	6	6	-	-	-	0	-	-	-	0	-	-	0	0
20	-	-	5	5	-	-	-	0	-	-	-	0	-	-	1	1
21	5	-	-	5	-	-	-	0	-	1	-	1	-	-	0	0
22	6	6	-	12	1	-	-	1	-	-	-	0	-	-	1	1
23	4	4	-	8	0	-	-	0	-	-	-	0	-	-	-	0
24	7	2	-	9	0	-	-	0	-	-	-	0	-	-	-	0
25	8	3	-	11	0	-	-	0	-	-	-	0	-	-	-	0
26	2	7	-	9	0	-	-	0	-	-	-	0	-	-	-	0
27	13	6	-	19	0	1	-	1	-	-	-	0	-	-	-	0
28	13	3	-	16	0	0	-	0	-	-	-	0	-	-	-	0
29	13	3	-	16	0	0	-	0	-	-	-	0	-	-	-	0
30	16	9	-	25	0	0	-	0	-	-	-	0	-	-	-	0
31	4	6	-	10	1	0	-	1	-	-	-	0	-	-	-	0
32	6	8	-	14	0	0	-	0	-	-	-	0	-	-	-	0
33	2	10	-	12	0	0	-	0	-	-	-	0	-	-	-	0
34	1	2	-	3	0	0	-	0	-	-	-	0	-	-	-	0
35	2	5	-	7	0	0	-	0	-	-	-	0	-	-	-	0
36	0	2	-	2	0	0	-	0	-	-	-	0	-	-	-	0
37	1	4	-	5	0	0	-	0	-	-	-	0	-	-	-	0
38	1	5	-	6	0	0	-	0	-	-	-	0	-	-	-	0
39	-	3	-	3	0	0	-	0	-	-	-	0	-	-	-	0
40	-	1	-	1	0	0	-	0	-	-	-	0	-	-	-	0
41	-	0	-	0	0	0	-	0	-	-	-	0	-	-	-	0
42	-	1	-	1	0	0	-	0	-	-	-	0	-	-	-	0
43	-	0	-	0	0	0	-	0	-	-	-	0	-	-	-	0
44	-	0	-	0	0	0	-	0	-	-	-	0	-	-	-	0
45	-	0	-	0	0	0	-	0	-	-	-	0	-	-	-	0
46	-	0	-	0	0	1	-	1	-	-	-	0	-	-	-	0
47	-	1	-	1	0	0	-	0	-	-	-	0	-	-	-	0
48	-	-	-	-	0	0	-	0	-	-	-	0	-	-	-	0
49	-	-	-	-	0	0	-	0	-	-	-	0	-	-	-	0
50	-	-	-	-	0	0	-	0	-	-	-	0	-	-	-	0
51	-	-	-	-	0	0	-	0	-	-	-	0	-	-	-	0
52	-	-	-	-	0	0	-	0	-	-	-	0	-	-	-	0
TOTAL	104	91	14	209	3	4	110	117	0	1	1	2	0	0	3	3

Appendix Table 5. Butter sole length frequency (numbers). M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO. 21

FORK LENGTH (CM)	M	F	U	T
11	-	-	1	1
12	-	-	1	1
13	-	-	6	6
14	-	-	13	13
15	-	-	14	14
16	-	-	9	9
17	-	-	5	5
18	-	-	3	3
19	-	-	8	8
20	-	-	14	14
21	15	2	-	17
22	22	10	-	32
23	14	8	-	22
24	23	16	-	39
25	16	22	-	38
26	10	14	-	24
27	9	11	-	20
28	4	6	-	10
29	1	3	-	4
30	1	4	-	5
31	3	5	-	8
32	2	4	-	6
33	-	0	-	0
34	-	0	-	0
35	-	1	-	1
36	-	0	-	0
37	-	0	-	0
38	-	1	-	1
TOTAL	120	107	74	301

Appendix Table 6. Dover sole length frequency (numbers). M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	21				28			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T
15	-	-	1	1	-	-	4	4
16	-	-	2	2	-	-	3	3
17	-	-	2	2	-	-	6	6
18	-	-	1	1	-	-	2	2
19	-	-	-	-	-	-	14	14
20	-	-	-	-	-	-	19	19
21	-	-	-	-	6	5	10	21
22	-	-	-	-	12	6	2	20
23	-	-	-	-	9	8	-	17
24	-	-	-	-	11	10	-	21
25	-	-	-	-	11	11	-	22
26	-	-	-	-	4	13	-	17
27	-	-	-	-	3	17	-	20
28	-	-	-	-	8	17	-	25
29	-	-	-	-	6	16	-	22
30	-	-	-	-	3	9	-	12
31	-	-	-	-	1	5	-	6
32	-	-	-	-	1	2	-	3
33	-	-	-	-	2	2	-	4
34	-	-	-	-	-	1	-	1
35	-	-	-	-	-	1	-	1
TOTAL	0	0	6	6	77	123	60	260

Appendix Table 7. Pacific cod length frequencies (numbers) by haul. M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	1				21				22				24			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T	M	F	U	T	M	F	U	T
22	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
26	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
27	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
28	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
29	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
31	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-
32	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
33	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
34	-	-	-	-	-	-	-	-	-	-	0	0	-	-	2	2
35	-	-	-	-	-	-	-	-	-	-	0	0	-	-	0	0
36	-	-	-	-	-	-	-	-	-	-	0	0	-	-	0	0
37	-	-	-	-	-	-	-	-	-	-	0	0	-	-	0	0
38	-	-	-	-	-	-	-	-	-	-	0	0	-	-	1	1
39	-	-	-	-	-	-	-	-	-	-	0	0	-	-	2	2
40	-	-	-	-	-	-	-	-	-	-	0	0	-	-	1	1
41	-	-	-	-	-	-	-	-	-	-	0	0	-	-	2	2
42	-	-	-	-	-	-	-	-	-	-	0	0	-	-	1	1
43	-	-	-	-	-	-	-	-	-	-	0	0	-	-	1	1
44	-	-	-	-	-	-	-	-	-	-	0	0	-	-	1	1
45	-	-	-	-	-	-	-	-	-	-	0	0	-	-	0	0
46	-	-	-	-	-	-	-	-	-	-	0	0	-	-	1	1
47	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-
48	-	-	1	1	-	-	-	-	-	-	0	0	-	-	-	-
49	-	-	0	0	-	-	-	-	-	-	0	0	-	-	-	-
50	-	-	0	0	-	-	-	-	-	-	0	0	-	-	-	-
51	-	-	0	0	-	-	-	-	-	-	0	0	-	-	-	-
52	-	-	0	0	-	-	-	-	-	-	0	0	-	-	-	-
53	-	-	0	0	-	-	-	-	-	-	0	0	-	-	-	-
54	-	-	0	0	-	-	-	-	-	-	1	1	-	-	-	-
55	-	-	0	0	-	-	-	-	-	-	1	1	-	-	-	-
56	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-
57	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-
58	-	-	0	0	-	-	2	2	-	-	-	-	-	-	-	-
59	-	-	0	0	-	-	0	0	-	-	-	-	-	-	-	-
60	-	-	1	1	-	-	1	1	-	-	-	-	-	-	-	-
61	-	-	0	0	-	-	2	2	-	-	-	-	-	-	-	-
62	-	-	0	0	-	-	0	0	-	-	-	-	-	-	-	-
63	-	-	1	1	-	-	0	0	-	-	-	-	-	-	-	-
64	-	-	0	0	-	-	1	1	-	-	-	-	-	-	-	-
65	-	-	0	0	-	-	1	1	-	-	-	-	-	-	-	-
66	-	-	0	0	-	-	1	1	-	-	-	-	-	-	-	-
67	-	-	1	1	-	-	0	0	-	-	-	-	-	-	-	-
68	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-
69	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	-
70	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	-
71	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	-
72	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-
73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	0	0	4	4	0	0	10	10	0	0	7	7	0	0	12	12

Appendix Table 7. Pacific cod length frequencies (numbers) by haul. M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	26				27			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T
22	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-
26	-	-	-	-	-	-	1	1
27	-	-	-	-	-	-	1	1
28	-	-	-	-	-	-	2	2
29	-	-	-	-	-	-	0	0
30	-	-	1	1	-	-	1	1
31	-	-	1	1	-	-	0	0
32	-	-	1	1	-	-	0	0
33	-	-	1	1	-	-	1	1
34	-	-	1	1	-	-	0	0
35	-	-	1	1	-	-	0	0
36	-	-	0	0	-	-	0	0
37	-	-	0	0	-	-	0	0
38	-	-	3	3	-	-	0	0
39	-	-	3	3	-	-	0	0
40	-	-	1	1	-	-	0	0
41	-	-	1	1	-	-	0	0
42	-	-	3	3	-	-	0	0
43	-	-	1	1	-	-	1	1
44	-	-	3	3	-	-	0	0
45	-	-	0	0	-	-	0	0
46	-	-	6	6	-	-	0	0
47	-	-	2	2	-	-	0	0
48	-	-	2	2	-	-	0	0
49	-	-	2	2	-	-	0	0
50	-	-	1	1	-	-	0	0
51	-	-	0	0	-	-	1	1
52	-	-	2	2	-	-	-	-
53	-	-	1	1	-	-	-	-
54	-	-	0	0	-	-	-	-
55	-	-	1	1	-	-	-	-
56	-	-	2	2	-	-	-	-
57	-	-	2	2	-	-	-	-
58	-	-	0	0	-	-	-	-
59	-	-	1	1	-	-	-	-
60	-	-	1	1	-	-	-	-
61	-	-	0	0	-	-	-	-
62	-	-	3	3	-	-	-	-
63	-	-	1	1	-	-	-	-
64	-	-	0	0	-	-	-	-
65	-	-	1	1	-	-	-	-
66	-	-	0	0	-	-	-	-
67	-	-	0	0	-	-	-	-
68	-	-	1	1	-	-	-	-
69	-	-	0	0	-	-	-	-
70	-	-	0	0	-	-	-	-
71	-	-	0	0	-	-	-	-
72	-	-	0	0	-	-	-	-
73	-	-	0	0	-	-	-	-
74	-	-	0	0	-	-	-	-
75	-	-	0	0	-	-	-	-
76	-	-	1	1	-	-	-	-
TOTAL	0	0	51	51	0	0	8	8

Appendix Table 8. Sandlance length frequencies (numbers) by haul. M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO.	11				25			
FORK LENGTH (CM)	M	F	U	T	M	F	U	T
13	-	-	-	-	-	-	10	10
14	-	-	-	-	-	-	12	12
15	-	-	-	-	-	-	9	9
16	-	-	5	5	-	-	2	2
17	-	-	1	1	-	-	2	2
18	-	-	2	2	-	-	-	-
TOTAL	0	0	8	8	0	0	35	35

Appendix Table 9. Sand sole length frequency (numbers). M/V DOUBLE DECKER, Hecate Strait, April 10-27,1984.

TOW NO. 25

FORK LENGTH (CM)	M	F	U	T
14	-	-	1	1
15	-	-	0	0
16	-	-	0	0
17	-	-	1	1
18	-	-	1	1
19	-	-	0	0
20	-	-	1	1
21	-	-	-	0
22	-	-	-	0
23	-	-	-	0
24	-	-	-	0
25	-	-	-	0
26	-	-	-	0
27	1	-	-	1
28	0	-	-	0
29	0	-	-	0
30	0	-	-	0
31	1	-	-	1
32	0	2	-	2
33	0	1	-	1
34	0	1	-	1
35	1	0	-	1
36	-	0	-	0
37	-	0	-	0
38	-	0	-	0
39	-	0	-	0
40	-	0	-	0
41	-	1	-	1
42	-	0	-	0
43	-	0	-	0
44	-	0	-	0
45	-	0	-	0
46	-	0	-	0
47	-	0	-	0
48	-	1	-	1
49	-	0	-	0
50	-	1	-	1
TOTAL	3	7	4	14

Appendix table 10. Oceanographic stations (XBT) occupied by M/V DOUBLE DECKER, April 10-27, 1984.

Consec. no.	Station no.	Day/Mo.	Time (PST)	Position		Bottom depth (m)	Depth (m)/Temperature (°C)													
				Lat. N	Long. W															
1	20	12/04	1515	52°49'	130°10.8'	228	0	5	10	20	70	80	90	100	110	120	130	150	175	200	228
							8.5	8.5	8.5	8.6	8.6	8.3	7.5	8.6	8.0	8.0	7.8	7.5	7.0	6.5	6.1
2		23/04	1540	53°58.7'	130°54.5'	95	0	5	10	20	50	70	90	95							
							9.4	9.3	9.3	9.2	9.1	9.0	9.0	9.1							
3	13	25/04	0735	52°00.0'	129°30.0'	205	0	5	20	30	50	60	80	100	120	130	150	160	170	190	205
							9.3	9.3	9.3	9.5	9.5	9.4	9.3	9.3	9.0	8.4	8.2	8.0	7.7	7.4	7.3
4	5	25/04	1335	51°24.0'	128°42.5'	210	0	5	10	30	50	100	120	130	150	170	190	200	210		
							7.5	7.7	7.7	7.8	7.8	7.8	7.8	7.6	7.0	6.7	6.1	6.1	6.1		